III. OPTIMIZATION

The median length of non-obligated service for physician specialists in the MHS, not including USUHS graduates is 2.9 years; however, the median length of non-obligated service as physician specialists for USUHS graduates is 9 years. The significance of the USUHS physician specialists serving three times longer than the other physician accession sources is critical to medical readiness as well as to cost-effectiveness. As our Armed Forces continue to be deployed into combat zones, USUHS graduates ensure that these superb uniformed personnel are provided with quality care from the initial preventive measures taken to protect their health, to the moment of injury, through their release from hospitalized treatment...

At present, 2,758 USUHS SOM alumni represent 23 percent of the active duty physician force. The 231 USUHS Graduate School of Nursing graduates are passing their certification examinations with outstanding scores and are cost-effectively providing essential skills under deployed conditions. The USUHS Graduate Education Programs in Public Health have been ranked sixth in the Nation for the past two years.

The Military Coalition supports the University in its cost-effective provision of career-oriented uniformed physicians, advanced practice nurses, and scientists dedicated to the provision of continuity and leadership and ensuring medical readiness for the Military Health System.

- **The Military Coalition, Signed by 35 Military Associations,** Letter to the Under Secretary of Defense for Personnel and Readiness, April 13, 2005.

Four USU programs generated over $33.6 million of cost avoidance for the Department of Defense during 2004: 144 USU faculty members provided 147,301 hours of clinical and consultative services at military treatment facilities (MTFs) for a documented cost avoidance of $16,094,907; the USU

Office of Continuing Education for Health Professionals (CHE) sponsored continuing medical education for 969 activities with an attendance of 7,409 physicians; provided continuing nursing education for 88 activities for 2,532 nurses; and, approved 34 programs of Category II (non-ACHE) continuing education credit for 692 members of the American College of Healthcare Executives for a documented cost avoidance of $4,769,942; the USU Military Training Network (MTN) generated a documented total of $11,372,044 in cost avoidance by facilitating DoD's ability to provide essential medical readiness training for over 205,709 defense personnel; and, the USU Graduate Education Programs generated $1,340,000 of cost avoidance when 38 uniformed officers received advanced degrees (34 Masters Degrees and 4 Doctoral Degrees) from the University.

- ***USU Cost Avoidance Fact Sheet*,** May 31, 2004.

USUHS physician specialists remain on active duty for an average of 9 years after they complete their specialty training - about three times longer than physicians trained under the Department of Defense's Health Professions Scholarship Program (HPSP). In fact, since the first graduating USUHS class in 1980 through January 2005, 80 percent of the 3,587 USUHS School of Medicine graduates remain on active duty in the Military Health System, comprising 23 percent of its active duty force. According to the Center for Navy Analysis, it likely would require at least 895 additional HPSP accessions to replace each year's class of 165 USUHS School of Medicine graduates. In a time of widely-held fears of a looming shortage of physicians and health care providers (such as advanced practice nurses), this retention powerhouse is an increasingly valuable resource for the Military Health System and the nation.

- **Michael D. Maves, M.D., MBA, Executive Vice President, CEO, the American Medical Association,** Letter to the Deputy Secretary of Defense, May 6, 2005.

The Uniformed Services Health Professions Revitalization Act of 1972, Public Law 92-426, established USUHS within the Military Health System (MHS) as the one institution where continuity, leadership and medical readiness would be designated as the highest of priorities. In addition to the typical curricula found in School of Medicine (SOM), Graduate School of Nursing (GSN), Graduate Education, or Continuing Health Education Programs, the University is mandated to respond to the special requirements of the MHS by incorporating unique military medical readiness training and expertise throughout its courses, field exercises and programs.

The extraordinary retention rates of the 3,587 USUHS SOM graduates have been independently confirmed. The median length of non-obligated service for physician specialists in the MHS, not including USUHS graduates, is 2.9 years; however, the median length of non-obligated service as physician specialists for USUHS graduates is 9 years. The significance of the USUHS physician specialists serving three times longer than the other physician accession sources is critical to medical readiness as well as to cost-effectiveness. For example, the Veterans Administration has had to spend billions of additional dollars for the services of contracted physician specialists due to 1,000 vacant civilian physician specialist positions. In contrast, the MHS has been able to increasingly rely upon the USUHS SOM alumni for the provision of such essential care.

The 231 USUHS GSN graduates are passing their certification examinations with outstanding scores and are cost-effectively providing essential skills under deployed conditions. The USUHS Graduate

Education Programs in Public Health have been ranked sixth in the Nation for the past two years, with over 300 uniformed officers receiving Masters and Doctoral Degrees in Public Health and Tropical Medicine and Hygiene (at no additional cost to DoD) from USUHS. Independent reports during 2002 and 2003 have documented that USUHS is the most cost-effective of the four major physician accession sources for filling senior physician specialist requirements. In fact, the annual OSD-recognized cost-avoidance generated by USUHS (i.e., patient care, continuing health professional education, and advanced degrees granted to uniformed officers) totaled $33.6 million for the MHS during 2004, which represents 47 percent of the USUHS O&M budget.

- ***United States Senators:*** **The Honorable Paul S. Sarbanes; The Honorable Barbara A. Mikulski;** ***Members of the United States House of Representatives:*** **The Honorable Chris Van Hollen; The Honorable Benjamin L. Cardin; The Honorable Elijah E. Cummings; The Honorable Steny H. Hoyer; The Honorable C.A. Dutch Ruppersberger; The Honorable Albert R. Wynn,** Letter to the Secretary of Defense, April 1, 2005.

III. THE GRADUATE SCHOOL OF NURSING

For military health care providers, "the fight" is different. They must be prepared to care for the sick, save lives, and beat the odds in severe environments. Many people think those odds are diminished severely after an injury on the battlefield. But, with the right preparation in operational readiness, nurses and physicians can make the difference.

- **Nursing Spectrum,** *Caring for Those in Harm's Way*, Volume 13, No. 6DC, March 24, 2003, page 8.

ESTABLISHMENT

Legislative and DoD Direction. The establishing legislation of the University, the Uniformed Services Health Professions Revitalization Act of 1972 (Public Law 92-426), and DoD Directive 5105.45, both direct that USU must meet the requirements of medical readiness and expand to meet the future needs of the Uniformed Services. In accordance with those directives, the Graduate School of Nursing (GSN) was established at USU. During the Fall of 1992, the Department of Defense received the authority, along with an appropriation, to begin planning for the implementation of a nurse practitioner education program at USU. The intent of the legislation was to meet the needs for advanced practice nurses in the Uniformed Services (the Army, Navy, Air Force, and the United States Public Health Service (USPHS). The Federal Nursing Chiefs initially identified the need for advanced practice nurses in two areas: Family Nurse Practitioner and Nurse Anesthesia. In 1993, Congress directed the initiation of a demonstration program for the preparation of family nurse practitioners for the Uniformed Services. By February 26, 1996, the GSN had received official approval and recognition from the Office of the Assistant Secretary of Defense for Health Affairs.

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GSN Meets Legislative and DoD Mandates. In compliance with Congressional legislation and in direct response to the needs of the Federal Nursing Chiefs and the Uniformed Services, the GSN initially established a Master of Science in Nursing Degree Program with two options in Nurse Anesthesia and Family Nurse Practitioner. These two GSN options were implemented to alleviate shortages of health care providers in the Uniformed Services, as identified by the Federal Nursing Chiefs. Graduates receive the Master of Science in Nursing (MSN) Degree and are qualified to test for national certification in their specialties.

The first students were admitted into the GSN Family Nurse Practitioner option in August of 1993; and, the first students matriculated into Nurse Anesthesia in June of 1994. Family Nurse Practitioner has had ten graduating classes from 1995 through April of 2005, for a total of 103 graduates; Nurse Anesthesia has had nine graduating classes beginning with the Class of 1996 through the Class of 2004 for a total of 121 graduates. The GSN Master Completion option has had a total of 7 graduates. Thus, from its first graduation in 1995 through April of 2005, a total of 231 MSN Degrees have been granted by the USU GSN.

GSN graduates have excelled in achieving national certification as advanced practice nurses in their specialties, with a 100 percent, first attempt pass rate from graduates of the Family Nurse Practitioner and Nurse Anesthesia (NA) Options in the MSN Program for the Class of 2004. Of the 103 Family Nurse Practitioner (FNP) graduates, all have passed their certification examination, with 100 doing so on their first attempt; thus, ***the GSN FNP graduates have a 97 percent first attempt pass rate***. To further illustrate the academic excellence of the GSN graduates, twelve of the 17 graduates from the GSN Nurse Anesthesia Program and the Navy Nurse Corps Anesthesia Program, Class of 2004, who took the certification examination for nurse anesthetists scored the maximum possible score of 600; ***the average score of the GSN NA Class of 2004 was 596.2*** (with a standard deviation of 8), well above the national average, which was 551.5 (with a standard deviation of 63).

Today, the GSN is unique among the Nation's nursing programs as it educates students to support the health care mission of the Military Health System (MHS) during peace, war, disaster, and other contingencies. GSN students are prepared to contribute to the peacetime health care delivery systems of the Uniformed Services and to provide unique support during combat operations, civil disasters and humanitarian missions; they are prepared to serve under austere and harsh conditions in field hospitals, on ships, and during air evacuations. For example, GSN alumni continue to support operations in South East Asia and the Persian Gulf. The GSN curricula include an increased focus on leadership; and, rotations with senior health care executives provide opportunities for increasing the students' understanding of health care policy and for networking with uniformed and professional leaders. GSN alumni have published articles, presented at national conferences, completed post-graduate courses, and are enrolled in doctoral studies. Along with the GSN faculty, GSN alumni are recognized leaders within their specialties and actively participate in national and international nursing organizations.

To meet its legislative and DoD directives, the GSN's *internal community of interest* extends throughout the University. It includes the executive staff at USU and the students, faculty, research, and administrative personnel within the GSN and the School of Medicine (SOM). The GSN faculty and students provide meaningful contributions to USU committees and collaborate on projects throughout the GSN and the University. The Federal Nursing Chiefs represent one of the GSN's *external communities of interest*. The Federal Nursing Chiefs, serving as a Board of Advisors to the GSN since 1993, meet at least twice a year to provide and receive information on the GSN's curricula and program effectiveness. Information provided by the Service Chiefs is incorporated into the strategic planning process of the GSN during continuous review and revision of its mission, philosophy, objectives and curricula. (**NOTE:** The Federal Nursing Chiefs include representatives from the Army, Navy, Air Force, Public Health Service, and the Department of Veterans Affairs. The American Red Cross, although not a Federal agency, is an honorary representative on the GSN Nursing Board of Advisors.) The GSN's external communities of interest also include USU alumni, uniformed supervisors of GSN alumni, members of the uniformed and civilian nursing communities, the Departments of Defense and Veterans Affairs, and the United States Congress.

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MISSION

The Accrediting commission pointed out in its summary findings to the University that the mission and philosophy of the USUHS Graduate School of Nursing (GSN) is grounded in the University's mission and in the mission of the Uniformed Services. The GSN Curriculum is designed to be specific to the unique mission of military service nurses: to serve in times of war and peace.

- **The Honorable Daniel K. Inouye, the United States Senate**, Congressional Record, *Tribute to Dr. Faye Glenn Abdellah*, May 15, 2002, pages S4488-S4489.

Mission Direction. The Mission Statement for the GSN is derived from the overall Mission Statement of the University and is in compliance with DoD Directive 5105.45. The ***initial mission*** of the GSN included five major objectives: 1) the GSN is dedicated to providing quality education to prepare advanced practice nurses, at the graduate level, in the specialties of Nurse Practitioner and Nurse Anesthesia; 2) the GSN must produce graduates who are both qualified for, and dedicated to, the delivery of primary care (acute and chronic care), including anesthesia services, to active duty members of the Uniformed Services, their families, and all other eligible beneficiaries during peace, war and other contingencies; 3) the GSN is also directed to provide the Nation with graduate nursing professionals who are willing to commit themselves to a career of service in the Department of Defense and the United States Public Health Service; 4) the GSN must serve the Uniformed Services and the Nation as an innovative, responsive program with a world-wide perspective for leadership, education, research, and service; and, 5) the GSN must develop advanced practice nurses, with unique experience and skills, who can respond to the special requirements of the Uniformed Services for disaster relief, humanitarian intervention, and military readiness.

The mission of the GSN is in full compliance with the goals of the Assistant Secretary of Defense for Health Affairs. The GSN remains dedicated to providing a quality and unique education that prepares nurses to deliver care and services to all beneficiaries of the Uniformed Services during peace, war, and other contingencies. The GSN faculty and staff provide the Nation with graduate nursing professionals dedicated to a career of service for the Department of Defense, the USPHS, and other Federal Health Systems.

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Mission Accomplishment.

The University's academic programs are consistent with its mission. In particular, the Team notes, the professionalism of the programs, the objectives to develop the student's intellectual and leadership skills, which are prerequisites for strong foundations in medicine, nursing, the biomedical sciences and public health services, and the credentials of the faculty.

- **Evaluation Team of the Middle States Commission on Higher Education,** Report to the Faculty, Administration, Trustees, Students of the Uniformed Services University of the Health Sciences, April 2, 2003; accreditation was granted to the University through 2013.

Since 1993, with the strong cooperation and support of the Federal Nursing Chiefs, the GSN has: 1) recruited a qualified faculty; 2) established curricula for the Family Nurse Practitioner, Nurse Anesthesia, and Perioperative Clinical Nurse Specialist options in its MSN Program and a Doctoral Program that leads to the Ph.D. in Nursing Science; 3) identified hundreds of clinical practice sites (the GSN currently has memoranda of understanding (MOUs) with 21 military treatment facilities (MTFs) to include an additional 111 non-DoD, Federal, and civilian clinical sites); 4) developed and implemented an administrative structure that provides for faculty and student participation in the overall governance of the GSN; 5) submitted self-studies and received accreditation for its MSN Degree Program from three professional accrediting entities (status of recent accreditations follows); 6) received approval from Health Affairs, Office of the Secretary of Defense, on February 26, 1996; 7) initiated curricula and governance reviews; 8) collaborated with the Department of Veterans Affairs and utilized state-of-the-art technology to establish distance learning options, which resulted in the DoD's first virtual graduation at the advanced level; and, 9) as of April 2005, granted Masters of Science in Nursing Degrees to 231 advanced practice nurses, with over 80 percent of its graduates remaining on active duty.

The Implementation of two Post-Master Options. In addition to the establishment of its two traditional MSN Program options of Family Nurse Practitioner and Nurse Anesthesia, the GSN also implemented a Post-Master Family Nurse Practitioner option and the Department of Veterans Affairs (VA)/ Department of Defense (DoD) Post-Master Adult Nurse Practitioner (ANP) Distance Learning Program (ANP). The Post-Master Family Nurse Practitioner Certificate option began in 1999, primarily in response to, and in support of, the decision by the Army Nurse Corps to transition from a specialty nurse practitioner to a family nurse practitioner focus. During the transition, the number of students varied, resulting in the awarding of two to four certificates per year; as of April 2005, a total of 15 Post Master Certificates have been granted.

The VA/DoD ANP Certificate Program was initiated in collaboration with the Department of Veterans Affairs (VA). The VA had identified a requirement to increase its number of adult nurse practitioners throughout its health care system, which included approximately 173 Medical Centers and 771 ambulatory care and community-based clinics. The student body was composed of civilian VA employees who maintained their full-time responsibilities at the VA facilities while participating in the program. The curriculum incorporated video teleconferencing technology as the primary teaching tool, with faculty conducting GSN-designed, lecture-based instruction. Students participated from VA medical

centers located across the United States, Puerto Rico, and the United States Virgin Islands; following the third graduation in May of 2003, the GSN had awarded a total of 70 certificates (this program is covered in more detail at the end of this section of the Journal).

The Development of a Clinical Nurse Specialist Option.

Background. The first Clinical Nurse Specialist Program was established in 1954 at Rutgers University; it was designed to prepare nurses at the Master Degree level who would be dedicated to improving patient and family care in the face of significant technologic advances in cardiac and pulmonary surgery. Early Clinical Nurse Specialists were known by a variety of titles, including *nurse clinician*, *clinical associate*, *liaison nurse*, *clinical supervisor*, and *clinical nurse specialist*. By 1970, the core function of the role of the Clinical Nurse Specialist was identified as a graduate-prepared nurse who was able to: 1) assess the nursing needs of patients and develop nursing care plans based on the knowledge of nursing, medical, biological, and social sciences and generally direct the provision of nursing care in the patient unit; 2) consult with others, as needed, and make appropriate use of available administrative and organizational channels in support and maintenance of nursing performance; 3) establish and evaluate standards of clinical nursing practice in a unit; 4) teach patients and nursing staff in a unit how to improve clinical outcomes; and, 5) introduce nursing practice innovations and refine nursing procedures and techniques and investigate specific nursing practice problems.

Today, there are approximately 58,000 clinical nurse specialists in the United States. They provide care in a variety of clinical specialties in both in-patient and out-patient settings. According to the Division of Nursing, National Sample Survey of Registered Nurses, Clinical Nurse Specialists employment breaks down as follows: *50.3 percent - Hospitals* (24.4 percent have no direct patient care and work primarily in staff development and administration; 46.6 percent work as part of in-patient units; 19.1 percent work as part of out-patient units; and, 9.8 percent work in other patient care areas); *19.5 percent - Nursing Education*; *13.4 percent - Community Health*; *9.5 percent - Ambulatory Care*; and, *7.3 percent - Other* (Private Industry, Pharmaceuticals, etc.).

In June of 2001, the Federal Nursing Chiefs identified a need for a Clinical Nurse Specialist (CNS) option in the GSN Master of Science in Nursing Program. A feasibility study and the development of a pilot program were completed and accepted by the Federal Nursing Chiefs. In January of 2002, **Founding Dean Faye Glenn Abdellah** and the GSN Associate Dean presented the CNS option to the USU Executive Committee; the Surgeons General of the Army, Navy and Air Force approved that request. The CNS option was then approved by the USU Board of Regents during its meeting held on February 27, 2002. And, the GSN welcomed its Charter Class of eight students in the GSN Perioperative CNS option in June of 2003. And, nine students entered the GSN Perioperative CNS option in June of 2004.

The Development of a Doctoral Program in Nursing. To meet an evolving requirement for nursing research relevant to the MHS, the USPHS, and other Federal Health Systems, in March of 2002, with the support of the Federal Nursing Chiefs, the GSN began the process for the development of a Doctoral Program in Nursing. The GSN Doctoral Program prepares nurses to be uniquely qualified as leaders in research, education, and clinical practice and serve in the MHS, USPHS, and other Federal Health Systems. In the context of concerns over patient safety, nursing research must be conducted to assess the linkages between nurse staffing, safety, and outcomes assessment throughout the TRICARE Management Activities.

Additionally, with the well-recognized national shortage of both staff nurses and nursing faculty, GSN doctoral graduates are prepared to augment faculty requirements in educational settings and to provide researchers for studying health care in the MHS, USPHS, and other Federal Health Systems.

In June of 2002, following the arrival of the second GSN Dean, **Patricia A. Hinton Walker, Ph.D., RN, FAAN**, parallel planning was initiated to review the existing curriculum to ensure the supportability of new programs. Following an analysis of capabilities, a curriculum was designed that would be responsive to the Federal Nursing Chiefs and flexible enough to easily adapt to the changing requirements of the Uniformed Services. The Doctoral Program in Nursing Science includes a common core of required courses and electives. The program consists of five areas of concentration: 1) *Nursing Knowledge*; 2) *Research Methods, Statistics, and Designs*; 3) *Cognate Courses*; 4) *MHS and Federal Health Care Policy and Issues*; and, 5) the *Dissertation*. Dean Hinton Walker presented the GSN Doctoral Program to the USU Board of Regents and received formal approval for the establishment of the Doctoral Program at the BOR meeting held on October 24, 2002. In addition, the GSN held inclusive focus sessions during 2003 to determine both the interest and support for its proposed doctoral program from doctorally-prepared nurses serving in the Uniformed Services, the Department of Veterans Affairs, and other Federal agencies. The GSN welcomed its Charter Class of three full-time and ten part-time students in the GSN Doctoral Program in June of 2003. Twelve additional students (four full-time and eight part-time) enrolled in the GSN Doctoral Program in 2004.

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GSN Nursing Philosophy.

I pledge myself to faithfully practice the profession of nursing. I recognize that with higher learning comes greater responsibility: first and foremost, to those placed in my care; to the advancement of nursing science; and, to the promotion of the nursing profession. I will strive for personal and professional growth through empirical knowledge and within the highest moral and ethical standards of research. I will remember the long and prestigious traditions of nursing, dating from the early battlefields to the diverse professions of today; and, upon this foundation, I am called to build. Whether caring for those in my own country or in a foreign land, I will not compromise their safety or dignity, but instead will care for them within the highest standards and practices of my profession.

- From the Oath taken by each new class of students at the GSN; the oath, developed by the Student Advisory Committee with input from the Federal Nursing Chiefs, was revised during the 2002-2003 Academic Year.

The philosophy of the GSN conforms to the mission and goals of the USU Strategic Plan. The GSN philosophy is built on a foundation of nursing theory, research, and advanced practice, which fosters critical thinking and a vision for the future health care requirements of the Uniformed Services. The GSN community believes that graduate nursing education builds on the foundation of the undergraduate nursing education already completed by the uniformed students. With that in mind, the GSN provides the Nation with nurses prepared at the Master Degree level (*and in the near future, the Doctoral Degree level*), who pursue learning experiences that will increase the breadth and depth of their knowledge base and enable them to specifically address the special needs of uniformed health care. The GSN prepares its students for collaborative and autonomous advanced practice roles with an emphasis on: health promotion and disease prevention (*readiness*); management and delivery of primary health care to families and individuals across the life span; case management for the chronically and stable acutely ill; anesthesia service; administration; and, unique expertise in emergency preparedness and military medical/nursing humanitarian assistance. Also, GSN students achieve an advanced level of knowledge to perform and provide leadership as uniformed officers in a joint service environment. And, finally, GSN graduates are prepared to participate in research or studies that are focused on operational readiness, clinical decision making, and population health and outcomes and will advance the Uniformed Health Profession and improve the practice of nursing as well as the welfare of patients throughout the Uniformed Health Systems.

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ACCREDITATION

Accreditation Granted by the National League for Nursing Accrediting Commission.

The Uniformed Services University of the Health Sciences Graduate School of Nursing (GSN) has met and exceeds all criteria for continuing accreditation. This program provides an outstanding model for preparing advanced practice nurses for military service and care of patients in crises and disaster situations.

- **The National League for Nursing Accrediting Commission**, Final Report, dated March 18, 2002, granting accreditation for the maximum term of eight years.

Background. The Commission on Higher Education of the Middle States Association of Colleges and Schools accredits the University. The National League for Nursing Accrediting Commission (NLNAC) and the Commission on Collegiate Nursing Education (CCNE) accredit the GSN. In addition to accreditation from the NLNAC and the CCNE, the MSN option in Nurse Anesthesia is also accredited by the Council on Accreditation of Nurse Anesthesia Educational Programs (COA); and, the MSN Family Nurse Practitioner option meets, or exceeds, all standards established by the National Organization of Nurse Practitioner Faculties (NONPF).

In December of 1996, the USU GSN Master of Science in Nursing Degree Program was evaluated for accreditation by the National League for Nursing (NLN) Board of Review for Baccalaureate and Higher Degree Programs. The NLN Board of Review voted to grant accreditation to the USU GSN Master Degree Program and scheduled its next visit for reaccreditation during 2001; during 2000, the GSN began the preparation for its required self-study and site-visits.

Site Visit and Final Report of the NLNAC Site Surveyors. On October 30 through November 1, 2001, Site Surveyors from the National League for Nursing Accrediting Commission (NLNAC) visited the USU GSN. The following excerpt is taken from the final report of the NLNAC:

The accreditation visit was announced directly to the Nursing Chiefs of the United States Army, Navy, Air Force, and Public Health Service, who disseminated this information through written memoranda and verbal comments to staff at respective hospitals and installation sites. The Federal Nursing Chiefs met with the program evaluators and gave testimony to their support of the GSN. Comments during the meeting with the Federal Chiefs included: 1) we are excited to see the quality of the students who graduate from this program... they are exceptional leaders; 2) we are directly involved in helping the School understand the type of skills graduates need and find them very responsive to our suggestions; and, 3) we are pleased to see that more faculty are completing doctoral degrees and support the actions taken by the Dean to give faculty release time to make it possible for them to accomplish this goal.

In addition to meeting with the Federal Nursing Chiefs, the NLNAC also interviewed 17 individuals who represented the senior leadership at the University. Group conferences were held with the GSN faculty, the GSN Dean's Council, the GSN students, and the Nursing Chiefs of the Branches of the Uniformed Services and their Deputies. Reviewers attended numerous GSN classes, which included Neuroscience II, Basic Principles of Nurse Anesthesia Practice, and Advanced Health Assessment. Six agencies and USU facilities were visited: the Walter Reed Army Medical Center; the National Naval Medical Center's Family Practice Clinics; the National Capital Area Medical Simulation Center (SIMCEN); the Anatomical Teaching Laboratory at USU; the USU Learning Resource Center; and, the Silver Spring Office Complex of the GSN.

A thorough review of documents included: Policy and Precedent Statements; the VA/DoD Post-Master Adult Nurse Practitioner Distance Learning Program: From Concept to Graduation; the 2000 Edition of the USU Journal; the Program for Design Notebook for the proposed construction at the USU campus; the alumni survey tool and data summaries; the GSN Strategic Plan; Dean Abdellah's Curriculum Vita; Curriculum Vita for the entire GSN faculty; course syllabi and random selections from both the Family Nurse Practitioner and Nurse Anesthesia options; examples of students' scholarly projects; clinical site information; the GSN budget; most recent accreditation and approval reports; minutes from the GSN Faculty Council and Corps Chiefs Meetings; committee reports from the GSN Evaluation, Student Promotion, Student Advisory, and Admissions Committees; and, extensive course materials.

In a letter to the USU President, dated January 24, 2002, **the Honorable William Winkenwerder, Jr., M.D., Assistant Secretary of Defense for Health Affairs,** noted:

> **I wish to convey my congratulations to you, Dr. Abdellah, and the entire staff of the Graduate School of Nursing of the Uniformed Services University of the Health Sciences. Your outstanding performance was recently recognized by the National League for Nursing Accrediting Commission (NLNAC) in its report granting continuing accreditation for an impressive eight additional years. I am particularly gratified by the following statement: This program provides an outstanding model for preparing advanced practice nurses for military service and care of patients in crisis and disaster situations. This program is on the cutting edge of cost effectively incorporating advanced technology into the curriculum and instruction process to produce a highly competent practitioner... This is a truly outstanding review of the school, which reflects great credit upon your entire staff and our Military Health System. Congratulations to all for a job exceptionally well done!**

Notification of Maximum Accreditation. On March 18, 2002, the Dean of the GSN was formally notified of the action taken by the National League for Nursing Accrediting Commission at its meeting held on February 27, 2002: **"The Commission approved the Master Degree Program for continuing accreditation and scheduled the next evaluation visit for the Fall of 2009."** Patterns of strength affirmed by the Commission were identified as follows: the mission of the GSN; the Dean's exemplary leadership and expertise; and, the learning resources. The rationale for granting accreditation for the maximum of eight years was provided in the NLNAC final report:

> **The Uniformed Services University of the Health Sciences GSN has met and exceeds all criteria for continuing education. This program provides an outstanding model for preparing advanced practice nurses for military service and care of patients in crises and disaster**

situations. This program is on the cutting edge of cost effectively incorporating advanced technology into the curriculum and instruction process to produce a highly competent practitioner. This program can serve as a model to advance nursing education, practice and scholarship as nursing moves into care of the global community.

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Accreditation Granted by the Commission on Collegiate Nursing Education.

Background. The American Association of Colleges of Nursing (AACN) Commission on Collegiate Nursing Education (CCNE) has implemented an accreditation process for nursing programs. The GSN prepared and submitted material to meet the CCNE requirements for preliminary accreditation (a special accreditation for programs that had already received recent national accreditation from other organizations such as the NLN). The GSN material was accepted and the AACN/CCNE granted preliminary accreditation on February 27, 1998. A site visit was scheduled by the CCNE for November of 2001.

Site Visit and Final Report of the CCNE Evaluation Team. On November 14 through 16, 2001, the CCNE Evaluation Team visited the USU GSN. The following excerpts were taken from the final CCNE report:

The GSN faculty members are responsive to the needs of the Federal Nursing Chiefs of the Uniformed Services and are willing to work on program modifications suggested by this external community of interest... Communication between the GSN faculty and the Federal Nursing Chiefs is enhanced by monthly teleconferences and semi-annual meetings. In addition, the GSN has an accreditation committee that works to ensure that consistency and congruence between mission, philosophy, and goals/objectives occur within each program. Students described responsiveness of the faculty in assisting them to meet the objectives of the program and in making alterations as necessary in compliance with the mission of the school and university.

Faculty members have extensive opportunities to participate in the governance of the USU GSN. Faculty identified professional and collegial collaboration between all military and civilian GSN faculty, as well as other faculty at the University level... USU provides a supportive environment for teaching, research, service, and practice... Support is given to faculty for development in areas such as time for clinical practice, service to national organizations, and pursuit of doctoral education... All faculty interviewed articulated an overwhelming commitment to the GSN, the students, and their jobs. They describe a genuine happiness with coming to work each day and preparing the best nurses for military service that can possibly be accomplished.

Students reported participation in GSN program decisions and open communication patterns with all GSN faculty. Their feedback is utilized, and the students reported that they are notified of program changes. Students were very articulate in describing the process used to provide input into program development. The GSN has an excellent educational environment with many state-of-the-art laboratory simulation rooms, library and resource materials, and

technological support services... GSN students interviewed verbalized knowledge of the many resources available to them on campus and had overwhelmingly positive comments about the laboratories, libraries, simulation center, and virtual reality programs available to them for study.

The inclusion of an interdisciplinary approach to course implementation and content delivery was evident by interdisciplinary team teaching and collaboration across departments. Opportunities to participate in health care delivery on a global scale are consistent with the mission of the university and the professional standards. Clinical experiences are in a variety of sites, all of which are accredited by JCAHO and COA. All clinical sites support the curriculum and course objectives and provide a variety of learning opportunities for clients across the lifespan. Many of the clinical sites are military-related and further support the socialization of the student into the role of the military Advanced Nurse Practitioner.

CCNE Evaluation Team Process. While visiting the GSN campus, the CCNE Evaluation Team had an opportunity to interview school and university officials, program faculty, clinical preceptors, students, and other community representatives. During the site visit, the CCNE Evaluation Team also met with the Federal Nursing Chiefs in their capacity as the Board of Advisors to the GSN. As with the NLNAC evaluators, the Federal Nursing Chiefs once more expressed their strong endorsement and satisfaction with the graduates of the GSN. The Evaluation Team reviewed information provided in the self-study document, as well as other materials provided in the resource room, to include information requested by the Evaluation Team. In addition, the CCNE Team also observed classroom and clinical activities. The Evaluation Team reviewed and provided assessments on the following Standards for Accreditation: Mission and Governance; Program Quality - Institutional Commitment and Resources; Program Quality - Curriculum and Teaching-Learning Practices; and, Program Effectiveness - Student Performance and Faculty Accomplishments. The Evaluation Team's final report found that the GSN had met all Standards and all Key Elements of the Standards with no recommendations for improvement.

Notification of Maximum Accreditation. On May 16, 2002, the Dean of the GSN received official notification from the Commission on Collegiate Nursing Education that **"the CCNE Board of Commissioners acted at its meeting on April 20, 2002, to grant accreditation of the Master Degree Program in Nursing at the Uniformed Services University of the Health Sciences for a term of 10 years, extending to June 30, 2012."** The next on-site evaluation is scheduled for the Fall of 2011. The following rationale was provided for the maximum accreditation of 10 years without recommendations:

At its meeting the CCNE Board determined that the program met all four accreditation standards. The Board additionally determined that there are no compliance concerns with respect to the key elements. The Commissioners express our best wishes as you proceed with tasks important to the future of your nursing program.

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Re-Accreditation Granted by the Council on Accreditation of Nurse Anesthesia Educational Programs.

> **The members of the Council on Accreditation of Nurse Anesthesia Educational Programs (COA) are pleased to inform the Uniformed Services University of the Health Sciences Graduate School of Nursing Nurse Anesthesia Program... that continued accreditation has been granted... Given this action of the COA, the program will be scheduled for its next consideration of continued accreditation in the Fall of 2013... Finally, the COA would like you to know that very few programs are not required to submit progress reports following an accreditation review and even fewer programs have achieved the maximum accreditation of ten years. Therefore, the members of the COA are particularly happy to offer their congratulations to everyone at the program who has demonstrated their commitment to meeting the requirements for continued accreditation.**
>
> - **The Council on Accreditation of Nurse Anesthesia Educational Programs (COA),** Letter to the USU GSN, October 31, 2003.

In September of 2002, the Nurse Anesthesia Program embarked on a re-accreditation process. Under the leadership of the Re-Accreditation Task Force Co-Chairs, **LtCol Paul Austin, USAF, NC,** and **CAPT Cynthia Cappello, NC, USN,** the self-study was prepared based on the new accreditation standards of the COA. Resulting from the first revision in many years, the new standards *raised the bar* for Nurse Anesthesia Programs. The entire curriculum was reviewed, including the didactic and clinical phases. In April of 2003, the COA reviewers visited the USU campus and clinical sites at the Walter Reed Army Medical Center and the Wright-Patterson Air Force Base Medical Center in Ohio. The reviewers met with school and university officials, program faculty, clinical site personnel, students, and other community representatives. The reviewers also met with representatives of the Federal Nursing Chiefs in their capacity as the Board of Advisors to the GSN. All educational materials were reviewed as well as the physical plant and clinical activities. The reviewers' outbrief lauded the entire program.

Notification of Maximum Accreditation. In October of 2003, USU received notification that the Nurse Anesthesia Program had been awarded a ten-year accreditation, as ***the very first program in the Nation re-accredited under the new standards and the very first program in the Nation granted the maximum ten-year re-accreditation***. The COA commended the GSN and the University for its excellent program and noted ***zero critical weaknesses***.

Self-Study Used as a National Example. The COA viewed the USU Nurse Anesthesia Program Self-Study as the benchmark for other programs. In 2004, officials from the COA requested permission to use the GSN Self-Study to guide and assist the seventy-seven other Nurse Anesthesia Programs in the United States in meeting the newly established COA standards.

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Establishment of an Honor Society of Nursing at USU. The USU Graduate School of Nursing was informed during 1998, that it had been approved by Sigma Theta Tau to sponsor a Nursing Honor Society, with the intent of becoming a Member Chapter of Sigma Theta Tau International. The Honor Society was formally established during graduation exercises in 1999 to recognize the academic excellence of students, the clinical and educational acumen of preceptors, and the contributions of nursing leaders in the community. *Membership in Sigma Theta Tau is the hallmark of a committed nursing professional* and offers great rewards in terms of potential funding for nursing research, networking with professional colleagues, and professional advancement. The 139 members who have been inducted into the GSN Honor Society are representative of the GSN's diverse student body along with senior leaders in nursing from both the uniformed and civilian sectors. Over the past several years, the GSN Honor Society has co-sponsored a series of women's health programs at the Women in Military Service Memorial at the Arlington National Cemetery. In addition, the Honor Society sponsored a military nursing research colloquium.

The GSN Honor Society co-sponsored a series of women's health programs at the Women in Military Service Memorial at the Arlington National Cemetery. In addition, the Honor Society sponsored a military nursing research colloquium. The application for approval as a Chapter of the Sigma Theta Tau International Honor Society of Nursing was forwarded in the Fall of 2002; and, a site visit by a member of Sigma Theta Tau was conducted in April of 2003. Following the site visit and extensive review of the GSN Honor Society, the Sigma Theta Tau site visitor indicated that her recommendation to the Sigma Theta Tau Board would be positive. Consequently, after review by the Sigma Theta Tau Board and approval by the Sigma Theta Tau House of Delegates, the GSN held a Sigma Theta Tau Charter Initiation Ceremony. The Tau Theta Induction Ceremony took place on May 10, 2004. Doctor May Wykle, immediate past president of Sigma Theta Tau International (STTI), presided and assisted the 438th Chapter of Sigma Theta Tau induct 192 charter members.

Since the induction, the officers and members of Tau Theta have been planning fundraising and meeting activities. As part of their fundraising efforts, a *Silent Auction* was held during the October 15, 2004 general membership meeting; over $3,000 was raised, which will be used to recognize and reward individuals in the areas of research, practice, administration, and education. The meeting was attended by over 40 members who participated in planning future Tau Theta activities. To better support its large, geographically disparate membership, Tau Theta leaders have developed a web presence for the 438th Chapter. In February of 2005, all Tau Theta members were provided with a *URL*, a Log-on ID, and a *Password* to access the on-line chapter site. Tau Theta has planned a very productive future, which includes: collaborating with STTI in developing a model interactive on-line chapter community; conducting a series of inductions at area DoD medical facilities; coordinating a membership meeting in conjunction with USU Founders Day Activities to be held in September of 2005; and, hosting the 2006 Region 12 Research Day Conference.

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MILITARY UNIQUE CURRICULA

The GSN Curricula Respond to the Special Needs of the Uniformed Services.

Background. The USU GSN is unique among the Nation's nursing programs because it educates students to treat and care for both civilian and uniformed personnel in peace, war, disaster, and other situations that occur under austere conditions. There is no other institution better positioned than the GSN to prepare nurses with research, education, and leadership expertise as required by the MHS, USPHS, and other Federal Health Systems. The GSN curricula have been driven by special requirements to meet the missions of the DoD and the USPHS. Common to the GSN academic curricula is subject matter relevant to military health care providers; for example, there are operational readiness components in each course. And, continuous consultation takes place with the Federal Nursing Chiefs during the on-going development and review of the GSN curricula in order to ensure that the special needs of the Uniformed Services are being met by the GSN graduates.

Based on the Federal Nursing Chiefs' initial indications that the career advancement of their officers would be enhanced through the completion of a Master Thesis, the GSN examined the feasibility of the completion of a thesis within the time constraints of its programs. Following an assessment of multiple program components, including a review of the graduating students' research projects and faculty expertise, a Master Thesis, which would become an extension of the charter students' research projects, was made a requirement for all graduating students, beginning with the graduating Class of 1996. However, during 1999, following consultation with the Federal Nursing Chiefs, it was determined that the GSN students could now choose among several types of scholarly projects, which include: research culminating in either a written thesis or a publishable paper; a research practicum; and/or, a defined project. Whichever option is chosen, any scholarly project may be completed individually or as a group project. A GSN research committee ensures that each scholarly project meets the Uniformed Services University of the Health Sciences' requirements for a Master of Science Degree.

Another example of the GSN's continuous response to the Services occurred when the Class of 1995 GSN graduates and their uniformed supervisors recommended the inclusion of training for such requirements as suturing, basic laboratory testing, and triage. The GSN faculty agreed and incorporated those procedures into the appropriate GSN courses. The graduates from the Family Nurse Practitioner option also recommended the addition of Anatomy and Cell Biology into the curriculum, which occurred during 1999. And, at the recommendation of the GSN students and faculty, during 2000, objective clinical examinations using simulated patients were implemented throughout the core courses of the GSN MSN Program. Also, as discussed earlier, the GSN developed an MSN Degree option for a Clinical Nurse Specialist at the request of the Federal Nursing Chiefs.

The GSN also responds to the impact of the current nursing shortage across the Nation; its evolving programs at both the Master and Doctoral Degree levels serve as incentives for the retention of uniformed nurses in the MHS and USPHS to serve as practitioners, nurse educators, or researchers. A critical, nation-wide nursing shortage is no longer predicted as a possibility; it has arrived. The following information from the American Association of Colleges of Nursing captures the impact of the current nursing shortages on health care delivery and medical readiness in both the civilian and uniformed sectors of our Nation:

According to the latest projections from the United States Bureau of Labor Statistics published in the November 2001, Monthly Labor Review, more than one million new and replacement nurses will be needed by 2010. The United States Department of Labor projects a 21 percent increase in the need for nurses nation-wide from 1998 to 2008, compared with a 14 percent increase for all other occupations (<*www.bls.gov*>);

According to a survey by the American Association of Colleges of Nursing, *2000-2001 Enrollment and Graduations in Baccalaureate and Graduate Programs in Nursing*, nursing schools turned away 5,823 qualified applicants across the United States due to insufficient number of faculty, clinical sites, classroom space, clinical preceptors, and budget constraints. More than a third (38.8 percent) of schools that responded pointed to faculty shortages as a reason for not accepting all qualified applicants into entry-level baccalaureate programs (<*www.aacn.nche.edu*>);

Graduations from Master and Doctoral Programs in Nursing are decreasing, which translates into a smaller pool of potential nurse educators. According to AACN's *2000-2001 Enrollment and Graduations in Baccalaureate and Graduate Programs in Nursing*, graduations from Masters Degree Programs were down 3 percent; graduations from Doctoral Programs were down 11 percent (<*www.aacn.nche.edu*>); and,

Higher Compensation in clinical and private sector settings is luring current and potential nurse educators away from teaching. According to the *2001 National Salary Survey of Nurse Practitioners* completed by ADVANCE for Nurse Practitioners magazine, the average salary of a master-prepared nurse practitioner working in his or her private practice was $78,217. In contrast, AACN reports that master-prepared nursing faculty across all ranks earned an average salary of $54,980 (<*www.aacn.nche.edu*> and <*www.advancefornp.com/npsalsurvey.html*>).

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Advanced Nursing Education in a Joint Service Environment. GSN Students are provided military unique education in the joint service environment of the University, which includes the Army, Navy, Air Force, and the United States Public Health Service (USPHS). Graduates are prepared to deliver care in a variety of settings and communities, both nationally and internationally. GSN graduates are equipped to contribute to the Uniformed Services' peacetime health care delivery systems and to provide military and public health support during combat operations, civil disasters, and humanitarian missions. They may serve in clinics or hospitals, the combat zones of theaters of operations under austere and harsh conditions, on Navy ships, or in isolated areas of the United States and other countries lacking health care providers. The GSN faculty and staff believe that the placement of the GSN within the interdisciplinary boundaries of the University is a distinct strength. The QuadService environment of the USU offers a unique blend of interactive didactic and clinical experiences that support the preparation of competent advanced practice nurses for service to the Nation during international conflict, in peacetime, and wherever humanitarian services and support for disaster relief are required. The multi-Service clinical practice sites of the GSN include: 21 military treatment centers (MTFs); and, 111 non-DoD, Federal, and civilian hospitals and primary care health care clinics generally located in the Washington, D.C. area.

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GSN Students Understand the Structure of a Joint Environment. To meet the readiness requirements of the Military Health System, it is essential that professional health care officers are familiar with the structure of a joint environment. Under the leadership of the USU Brigade Commander and the GSN Commandant, the uniformed students, faculty, and staff assigned and reporting to the GSN participate in all activities and events as they would in any other command of the Uniformed Services. Regular military formations are held; physical fitness exercises, standards, and testing are adhered to; performance evaluations are completed; and, uniformed personnel in the GSN are trained in the appropriate uniformed programs and customs. The students of the GSN participate in joint-service educational experiences throughout the MSN Degree Program; and, as a result, they become familiar with the regulations, procedures, and vocabularies of the QuadServices' health care systems. The GSN Commandant provides mentorship and guidance related to leadership, military customs and traditions, administrative requirements, and protocols to all of the uniformed officers enrolled in the GSN. Beginning with the GSN's first Commandant, Colonel Regina Aune, United States Air Force, the Nursing Chiefs have demonstrated their significant support for the GSN by assigning their very best officers to fill this critical position. The following officers have held the position since Colonel Aune's departure: Lieutenant Colonel Lori Fritz, United States Army; Lieutenant Colonel Judy Ikirt, United States Air Force; Lieutenant Colonel Marjorie Graziano, United States Air Force; Colonel Karen Gausman, United States Army (2001-2003); Lieutenant Colonel Regina Tellitocci, United States Army (2003); and, Lieutenant Colonel (P) C. J. Moore, United States Army (2004).

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Medical Readiness Training.

Students entering the GSN at USU have, on average, ten years of active military service as a registered nurse and officer. Almost half of these students have been deployed either on a humanitarian or combat oriented mission, and all of them have had rank- and specialty-specific military training.

Approximately 450 hours of operational medicine are integrated into all GSN programs. Graduates receive approximately 25 hours in the GSN core courses, over 290 hours of specialty-specific content within individual programs, 78 hours of didactic instruction in Military Contingency Medicine, and 12 hours in the Operation Readiness Course.

The Family Nurse Practitioner (FNP) and Perioperative Clinical Nurse Specialist (CNS) programs provide, on average, 8-10 more credit hours and 16 more weeks of education than the typical civilian FNP or CNS program. Students receive a minimum of 150 hours of classroom and simulation lab experiences learning military, operational, medical and leadership principles and over 90 hours applying this knowledge in a field environment. No other program provides this type of a learning experience.

The Nurse Anesthesia Program incorporates unique content that emphasizes operational readiness competencies. Students participate in simulation experiences incorporating field anesthesia practices and operational readiness discussions. In addition, some medical treatment facilities provide operational training including simulated deployment on humanitarian missions and animal laboratory experiences. The latter gives students practice

in advanced airway and venous access procedures. Senior students return to the university for an additional week of operational readiness training.

- **USU Board of Regents**, *Graduate School of Nursing Curriculum*, 2005 Report to the Secretary of Defense, page 11.

Because of the unique practice requirements for USU graduates as uniformed officers, the GSN faculty has included an additional terminal objective heading, "Readiness," not included in the American Association of Colleges of Nursing (AACN) "Essentials" document. *Readiness* was added to focus on specialized competency objectives encompassing the ability of the USU graduates to function during deployment or humanitarian health care circumstances. GSN terminal objective 6, which refers to the readiness of graduates to function during deployments or humanitarian health care circumstances, states that graduates will "adapt readily to changes in individual and environmental health care demands." To accomplish this objective, the GSN developed a core course, Operational Readiness, to provide mobility and field training. Lectures address the setup of field hospitals, the function and utilization of Navy hospital ships, aeromedical evacuation, and the use of telemedicine in the field.

- *IX, Graduate Education in Nursing,* Subcommittee Report, Middle States Association of Colleges and Schools (MSA) Self-Study, submitted in preparation for the 2003 site visit, pages 2 and 3.

As of April 2005, 110 students are enrolled on campus in the GSN (26 in the Family Nurse Practitioner option of the MSN Program; 17 in the Perioperative Clinical Nurse Specialist option; 44 in the Nurse Anesthesia option; and, 7 full-time/16 part-time in the Doctoral Program). One hundred and four commissioned officers represent the Services as follows: Army - 33; Navy - 16; Air Force - 48; and, Public Health Service - 7. Three of the remaining students are sponsored by the Veterans Administration; one student is sponsored by the Walter Reed Army Medical Center; one by the Agency for Healthcare Research and Quality; and, the final student is sponsored by USU/DoD. These GSN students receive operational medicine and military relevant material and training throughout the GSN curricula; as such, readiness is identified as one of the GSN's outcome goals. The GSN program of study is designed to: prepare students to adapt readily to changes in individual, system, and environmental health care demands; provide safe care under austere conditions; and, be flexible in caring for patients with unusual clinical presentations through the use of available resources. The program of study for the students has evolved to include additional clinical hours to prepare the GSN graduates for an immediate transition to work settings in either fixed facilities or deployed environments. Since April of 2001, GSN students complete a two-day course on humanitarian assistance. The Medical Humanitarian Assistance Course is designed to prepare advanced practice nurses for deployment in support of disaster relief and humanitarian missions. Emergency conditions, such as natural disasters, usually involve a humanitarian component and require the commitment of the Uniformed Services, often under austere conditions. The course includes guest speakers who present information on the Federal Emergency Management Agency, Non-Governmental Organizations, chemical-biological warfare, ethics, and epidemiology. The GSN continuously expands its educational programs to address the changing nature or threats caused by weapons of mass destruction. In

addition, GSN faculty were represented and participated in an International Coalition of Nursing Leaders that focused on the development of nursing curricula concerned with addressing the aftermath of weapons of mass destruction.

Preparing for the Battle.

As Army Nurse Corps officers in the USU Master Degree Family Nurse Practitioner Program, our education further prepares us to live out our motto - *Ready, Caring, Proud.*

Operation Bushmaster provided a scenario portraying a hostile environment. The week-long exercise (conducted in San Antonio, Texas) **allowed for Advanced Practice Nursing and School of Medicine students to work together in a field environment under simulated battlefield conditions. Seven graduate nursing students, 60 USU medical students, and 11 additional medical students from Japan and the United Kingdom were responsible for triage, management and evacuation of casualties.**

"We students found ourselves triaging and aggressively maintaining patient care as second nature. Biological and chemical agents played a much bigger part in our scenarios than we had experienced in previous training. The threat of these weapons was ever-present and a time consuming enemy tactic for all medical personnel that required proactive planning. At other times, both nurses and medical students racked their brains attempting to diagnose infrequently seen diseases, such as meningitis and malaria... Exotic diseases were present in our training scenarios as well. With the assistance of battlefield telemedicine and satellite communication with stateside facilities, such as the Walter Reed Army Medical Center in Washington, D.C., we were able to describe afflictions and send photos of patients for consultation, diagnosis, and treatment."

- **Nursing Spectrum,** *Caring for Those in Harm's Way*, Volume 13, No. 6DC, March 24, 2003, pages 8-9.

During the 2004 Operation Bushmaster exercises, 19 GSN students collaborated in a field environment with USU SOM students and medical students from Japan and the United Kingdom. Under simulated battlefield conditions, a war was fought in the mythical country of "Pandakar." All students served in a variety of roles to include the senior medical officer, commander, radio operator, litter bearer, security officer, and ambulance platoon leader. For a majority of the participating nurses, this served as a continuation of training under austere conditions. During their previous years of military service, several of the GSN students had been deployed on real world missions and had already completed courses in Trauma Nurse Critical Care and Combat Casualty Care. However, Operation Bushmaster provided unique clinical and leadership training opportunities for simulating the role of an Advanced Practice Nurse in a multi-disciplinary setting.

Both GSN and SOM students gained a strengthened appreciation for the role of the senior medical officer on the battlefield. Their playing field was leveled as they came to understand the common goal of ***providing good medicine in bad places.*** As they boosted each other's morale during the exhausting exercise, the GSN and SOM students recognized the synergies and challenges shared by the entire team. Operation Bushmaster has added a new dimension to the training of advanced practice nurses; ***Bushmaster embodies***

the spirit of the USU motto, Learning to Care for Those in Harm's Way. The GSN graduate students will continue to be fully integrated into the Bushmaster field exercises with the fourth-year medical students in the Summer of 2005 when the exercise moves to Fort Indian Town Gap, Pennsylvania. During a recent briefing, Major General Pollock (the current Army Nurse Corps Chief) indicated that Army Family Nurse Practitioners could be placed further forward in an operational environment as an independent practitioner filling some physician assistant slots and could potentially deploy within the first year after their completion of the FNP option. Because of the military's current involvement in multiple war and peace-keeping efforts throughout the world, it is essential for real-time operational training to continue to be included as part of the graduate school's curriculum.

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STUDENT AFFAIRS

Students reported participation in GSN program decisions and open communication patterns with all GSN faculty. Their feedback is utilized, and the students reported that they are notified of program changes. Students were very articulate in describing the process used to provide input into program development. The GSN has an excellent educational environment with many state-of-the-art laboratory simulation rooms, library and resource materials, and technological support services. Most classrooms are equipped with technology such as computers or LCD players for PowerPoint presentations and Internet access. A state-of-the-art simulation center is available to the GSN and is equipped with 12 fully equipped patient treatment rooms with computer, video, and audio equipment. In addition, the simulation center has a distance education teleconference room, a computer laboratory, and an operating room simulation laboratory with manikin simulators and anesthesia equipment which mimics that used in the military field. Virtual reality anatomy lectures are cutting edge and are available for approximately four anatomic systems. GSN students interviewed verbalized knowledge of the many resources available to them on campus and had overwhelmingly positive comments about the laboratories, libraries, simulation center, and virtual reality programs available to them for study.

- **Commission on Collegiate Nursing Education (CCNE)**, Final Report of the Evaluation Team, dated April 20, 2002, granting accreditation through June 30, 2012.

The Selection Process. A commitment to the Nation must be evidenced in an applicant's decision to attend the GSN. The GSN Admissions Committee makes the final determination regarding admission to the GSN with the concurrence of the Dean. The membership of the Admissions Committee is different from those at other schools of nursing. In addition to members of the GSN faculty, the Committee has representatives from each of the Uniformed Services and faculty from the School of Medicine.

The applicant pool is unique. Applications to attend the GSN are submitted in accordance with the guidelines of the Services for Long Term Health Education and Training (Army), Duty Under Instruction (Navy), and Sponsored Graduate Education Programs (Air Force Institute of Technology). Officers from the Public Health Service are sponsored by their individual Agencies. The Admissions Committee of the GSN reviews the applicants' records on the basis of academic merit, which shows that the applicants can succeed in a graduate program. Academic aptitude is balanced against the evidence of future officership and continuing commitment to service in the Uniformed Services. The candidates nominated and selected by the Uniformed Services have had grade point averages of between 3.2 and 4.0 in their Baccalaureate Programs; and, most have had an average of between eight to twelve years of active duty experience in the Uniformed Services.

Annually, the GSN reviews between 75 and 90 applicants and admits between 45 to 52 students. GSN students in the MSN Program are full-time and retain their rank as officers. GSN students in the Doctoral Programs may be full-time or part-time; and, uniformed officers retain their ranks while attending the GSN. To sustain the GSN's high graduation rate, incoming students receive instruction on time management and test taking skills. Committed faculty promote student retention through both didactic and lab review sessions.

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Class of 2006. The USU GSN welcomed the MSN Class of 2006, 51 active duty officers, during June of 2004. Eighteen officers were enrolled in the Family Nurse Practitioner (FNP) Class of 2006, bringing the enrollment of the two FNP classes (First and Second Year) to a total of 26 students. Twenty-four uniformed officers were enrolled in the Nurse Anesthesia Class of 2006, bringing the enrollment of the two Nurse Anesthesia classes (First and Second Year) to a total of 44 students. And, nine uniformed officers were enrolled in the Perioperative Clinical Nurse Specialist (PCNS) Class of 2006, bringing the enrollment of the two PCNS classes (First and Second Year) to a total of 17 students.

Of the 51 uniformed officers enrolled as First-Year GSN students: sixteen are members of the Army; eight are members of the Navy; twenty-six are members of the Air Force; and, one is a member of the Public Health Service. The GSN students range in grade from 0-2 to 0-4 with the majority at the 0-3 level. The student's service agreement following graduation is approximately two years of service for each year of education.

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Development and Functions of the Student Advisory Council - A Strong Avenue of Communication.

Background. Beginning in October of 1998 and continuing throughout 2004, the GSN students, faculty, and staff, in coordination with the Federal Nursing Chiefs and the Office of Student Affairs, School of Medicine, worked to develop and implement the Student Advisory Council. The Student Advisory Council was initially established during 1998 to: 1) advise the Dean, GSN, on matters of student interest and concern; 2) provide an active and visible means for the student body to communicate directly with the Dean; and, 3) serve as a process improvement mechanism and a forum for addressing student issues.

The Student Advisory Council (SAC) is an independent entity that exists to represent the GSN student body; it is not an element of the military rating chain, nor an extension of the administration. It serves as a line of communication between the student body and the administration of the GSN. The Council is designed to discuss student issues that arise across class boundaries and to provide a student body consensus, which may then be communicated to the Dean, GSN, and other responsible school officials.

Composition. The GSN Student Advisory Council consists of the student president, secretary, one representative from each MSN option area and class (thus two each from Nurse Anesthesia and Family Nurse Practitioner) and one representative from the Post-Master (PM) Nurse Practitioner Class. All members of the SAC are voting members. The president of the SAC is ordinarily the second-year class president.

The SAC Faculty Advisor assists and advises each class on the functions and responsibilities of the SAC, and works with the GSN Commandant to ensure that class elections of officers and academic representatives are completed on schedule each academic year.

Functions of the Council. The Student Advisory Council meets six times during the academic year, or more frequently as required. Decisions on any issue discussed at a meeting require a majority vote of the attending members. The student president prepares meeting agendas from input provided by other SAC members, conducts the meetings, and coordinates discussions and votes to establish a consensus of the

student body. The student president also met regularly during 2004 with the GSN Dean to discuss matters of interest to the student body. The SAC representatives act as advocates for the students in academic matters. They also act as a liaison between students and academic program areas and serve as the communication link for the students on such matters as changes in the academic schedule, rooms, etc. SAC representatives are responsible for writing an After Action Report at the conclusion of each academic semester, which is also discussed with the Dean. This report is a summary of student comments and feedback about each course, including faculty, books, and materials within the MSN Program options. Based upon its activities during 2004, the Student Advisory Council is serving as an excellent forum to ensure faculty/student involvement, communication, and on-going curriculum improvements.

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GSN Class of 2004 Outstanding Student Awards. Annually, the GSN Students are recognized for excellence in academics and clinical practice. During 2004, the following awards were presented:

Family Nurse Practitioner - Outstanding Graduate Award. **Lieutenant Commander (s) Barbara Mullen, USN,** distinguished herself as a student in the graduating Family Nurse Practitioner Class. This award recognizes that LCDR Mullen employed a sound scientific foundation, an inquiring mind, and a collaborative approach for the comprehensive care of her patients; and, she demonstrated personal initiative, perseverance, and outstanding characteristics throughout her academic endeavors at USU.

Family Nurse Practitioner - Academic Performance Award. **Lieutenant Commander (s) Barbara Mullen, USN,** received the Distinguished Academic Performance Award, which recognizes the student having the most outstanding academic proficiency in the graduating Family Nurse Practitioner Class.

Family Nurse Practitioner - Distinguished Clinical Performance Award. **Captain Barbara Reilly, USA,** received the Distinguished Clinical Performance Award, which recognizes the student having the most outstanding clinical proficiency in the graduating Family Nurse Practitioner Class.

Family Nurse Practitioner - First Year Outstanding Student Award. **Captain Mikesha Caulk, USA,** was selected to receive the First Year Outstanding Student Award.

Who's Who Among Students in American Universities and Colleges - FNP Program. **Lieutenant Commander (s) Barbara Mullen USN,** was recognized by Who's Who Among Students in American Universities and Colleges upon her graduation from the GSN.

Family Nurse Practitioner - Dean's Award for Research Excellence. **Lieutenant Commander (s) Barbara Mullen, USN,** received the Dean's Award for Research Excellence. The Dean's Award for Research Excellence recognizes the graduating student in the FNP Program demonstrating the most outstanding proficiency in nursing research.

Nurse Anesthesia - Outstanding Graduate Award. **Captain Joy Barerio, USAF,** distinguished herself as a student in the graduating Nurse Anesthesia Class. This award recognizes Captain Barerio for achieving high levels of academic performance while simultaneously demonstrating outstanding leadership qualities at USU.

Who's Who Among Students in American Universities and Colleges - RNA Program. **Captain Joy Barerio, USAF,** was recognized by Who's Who Among Students in American Universities and Colleges upon her graduation from the GSN.

Nurse Anesthesia - Distinguished Clinical Performance Award. **Lieutenant Adam Leeds, PHS,** received the Distinguished Clinical Performance Award, which recognizes the student having the most outstanding clinical proficiency in the graduating Nurse Anesthesia Class.

Nurse Anesthesia - Distinguished Academic Performance Award. **Captain William Dean Gilmer, USAF,** received the Distinguished Academic Performance Award, which recognizes the student having the most outstanding academic proficiency in the graduating Nurse Anesthesia Class.

Nurse Anesthesia - First Year Outstanding Student Award. **Captain Benjamin P. Landry, USAF,** was recognized as the First Year Outstanding Student for Nurse Anesthesia.

Nurse Anesthesia Presents the Agatha Hodgins Award. **Captain William Dean Gilmer, USAF,** was selected from the graduating Nurse Anesthesia Class of 2004 to receive the Agatha Hodgins Award during the USU Commencement Ceremonies in May of 2004. Captain Gilmer received the award upon completing the 18-month clinical phase in December of 2004. The award, established in 1975, recognizes a graduating nurse anesthesia student for outstanding accomplishments in both the classroom and clinical arenas of nurse anesthesia education. The recipient's dedication to excellence has furthered the art and science of nurse anesthesia. *Background.* The award was established in honor of Agatha Cobourg Hodgins (1877-1945), founder and first president of the National Association of Nurse Anesthetists. This organization was later renamed the American Association of Nurse Anesthetists. Miss Hodgins and Dr. George Crile pioneered the first known nurse anesthesia school and hospital service at Lakeside Hospital in Cleveland, Ohio. During World War I, Miss Hodgins trained nurse anesthetists for military service. She also assisted with the development of the early anesthesia machines and later with the perfection of anesthesia techniques still in use today.

Perioperative Clinical Nurse Specialist - First Year Outstanding Student Award. **Captain Jason Nelson, USA,** was selected to receive the First Year Outstanding Student Award for the Perioperative Clinical Nurse Specialist first year class.

GSN Student at Large Award 2004 - Esprit de Corps Award. **Captain Barbara Reilly, USA,** was selected to receive the Esprit de Corps Award. The Esprit de Corps Award recognizes one student from the graduating classes of the Graduate School of Nursing Master of Science in Nursing (MSN) Program who by thought, word, action, and deed, demonstrates sensitive humanistic qualities for the well being of all. By

example, Captain Reilly has inspired all of her classmates to enjoy their camaraderie, their profession, and their commitment to a life of service to mankind.

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GSN Students Participate at the American Association of Nurse Anesthetists (AANA) 71st Annual Meeting. The 71st Annual Meeting of the American Association of Nurse Anesthetists was held at the Washington State Convention Center in Seattle, Washington, during August of 2004. The meeting highlighted many accomplishments of Air Force Nurse Anesthetists with Major General Brannon, USAF, among the distinguished guests.

Lieutenant Colonel Paula Goodman, USAF (Ret.), was named the American Association of Nurse Anesthetists 2004 Clinical Instructor of the Year. She was nominated by her colleagues and students at the USU GSN Nurse Anesthesia Program clinical site located at the Wright-Patterson Air Force Base Medical Center. LtCol Goodman served for over five years as a clinical instructor, instilling the importance of knowledge, professionalism, and ethical conduct in her RNA students. By promoting advanced education, research, and diversity, she developed highly educated, proficient practitioners who continue to set the standard of excellence as nurse anesthetists.

AANA College Bowl. A popular event of the AANA Annual Meeting is the College Bowl. Six teams of four students competed *head-to-head* in preliminary rounds with the winners meeting in the final round. The GSN RNA Program was well represented in this event by three outstanding students: **Captain Joy Barberio, USAF**; **Captain Brian Molloy, USAF**; and, **Captain Erica Spillane, USAF**.

Poster Presentations. Nurse Anesthesia students from the GSN also submitted poster presentations at the 71st Annual Meeting of the AANA held in Seattle, Washington. Eight students of the Class of 2004 participated in the research efforts that resulted in the poster presentations. Research topics are indicated below (presenter's name is underlined):

Readiness Estimate and Deployability Index for Air Force Nurse Anesthetists: Mark Stevenson, SRNA, USAF, NC; Robert Scholes, SRNA, USAF, NC;

A History of Nurse Anesthesia in the Air Force: Robert Bland, SRNA, USAF, NC; David Perkins, SRNA, USAF, NC;

Pollution of Ambient Air by Volatile Anesthetics - Comparison of Four Anesthetics - Comparison of Four Management Techniques: Joy Barberio, SRNA, USAF, NC; Jason Bolt, SRNA, USAF, NC;

The Use of Ultrasound in Placement of Intravenous Catheters: Said Acosta, SRNA, USAF, NC; Hector Aponte, SRNA, USAF, NC;

The Effects of Fatigue on Performance of Anesthesia Providers in a Simulator Setting: Lieutenant Commander C. Cooper; Lieutenant R. Nations; Lieutenant L. Rhodes; Lieutenant J. Volk; Lieutenant Commander J.F. Burkard; Commander J. Pellegrini (Navy Nurse Corps Anesthesia Program, San Diego, California); and,

Performance of Portable Anesthesia Machine Ventilators Across Worsening Lung Conditions: Lieutenant Adam Leeds; Captain Christian Swift; Lieutenant Colonel Jacqueline Stark; and, Lieutenant Colonel Paul Austin.

Tri-Service Combat Anesthesia Symposium. **Major David Stamps (CRNA) EMEDS Course Director** at Brooks Air Force Base, was the organizer and presiding officer for the *Tri-Service Combat Anesthesia Symposium: Experiences from Operations Enduring Freedom and Iraqi Freedom* on August 10, 2004. Presenters included **Major Wade Morcom, USA, AN (CRNA)**; **Lieutenant Commander David Sheppard, USN, NC (CRNA)**; and, **Major Adrienne Hartgerink, USAF, NC (CRNA)**. This symposium, attended by approximately 200 anesthetists, gave the audience a unique perspective about caring for casualties in the Global War on Terror.

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GSN ALUMNI

I was the only anesthesia provider for about 900 people in the camp. We took care of military personnel from all Nations; they included Australians, French, Spanish, Dutch, Koreans, and many others. It was a wonderful experience to see the other cultures and to get to know them.

- **Major Kelley Moore, USAF, NC, CRNA, GSN Class of 1998, Anesthesia Element Chief, McGuire Air Force Base,** deployed to Ganci Air Base, Kyrgyzstan, in support of Operation Enduring Freedom in 2002; currently preparing to deploy to Southwest Asia.

Graduate Profile. As of April 2005, the GSN has 231 uniformed graduates who have received the Master of Science in Nursing (MSN) Degree *in residence*: Army - 68 (which includes seven Post-Master Graduates); Navy - 19; Air Force - 129; and, Public Health Service - 15. One hundred and three uniformed officers have graduated as Family Nurse Practitioners; 121 uniformed officers have graduated in Nurse Anesthesia; and seven from the Post-Master Family Nurse Practitioner Certificate option. As of April 2005, well over 80 percent of the GSN graduates remain on active duty in their individual Services. The GSN alumni do not have a formal residency requirement so they go directly into clinical practice, consistent with the credentialing guidelines at the individual health care facilities. The GSN alumni can expect to serve at least one tour as practitioners or anesthetists before being considered for assignments in any other role. The GSN alumni have three career tracks: clinical, administrative, and research. There are a number of "nontraditional" and operational assignments available as well; only a limited number of alumni would be expected to pursue those assignments. New avenues for command and staff positions are continuously opening for advanced practice nurses. It is expected that the GSN alumni will continue to be recognized and rewarded for their outstanding performance with career assignments of ever-increasing responsibility.

GSN Alumni Receive Outstanding Results on National Certification Examinations. The immediate measurable standard of success for GSN alumni is the passing of the National Certification Examinations. Over 97 percent of the GSN graduates have passed the National Certification Examinations at the upper percentile, on their initial examination. ***For example, credentialing scoring information released on February 26, 2002, by the American Nurse Credentialing Center's Commission on Certification shows that of the 15 GSN Family Nurse Practitioner graduates who took the certification examination, all 15 passed with a mean score of 123.3, the highest ever achieved. During 2003, all 10 GSN Nurse Anesthesia graduates passed the Council on Certification of Nurse Anesthetists Certification Examination on the first attempt, with seven of the ten earning perfect scores of 600; and, in 2004, nine out of 13 Nurse Anesthesia graduates received perfect scores on their Certification Examinations with all 13 passing on their first attempt***.

The GSN Uses a Systematic Approach for the Evaluation of Students, Alumni, and Supervisors. The GSN Master Plan for Program Evaluation outlines structure, processes, and outcomes associated with the GSN's evaluation approach, and identifies the focus of the evaluation, the individuals responsible for conducting the evaluation, the reporting chain, and the method and frequency of the evaluation. The overall responsibility for implementing the evaluation plan resides with the GSN Research and Evaluation

Committee. All GSN faculty participate in the acquisition, interpretation, and application of the resulting data; and, the committee has a central focus geared to the outcomes of the GSN, both short and long range. The Evaluation Program Administrator is responsible for administering the didactic evaluation program to include maintaining the databases, posting the course evaluations, downloading and evaluating the data, and disseminating the data to the Research and Evaluation Committee, Program Directors, and Department Chairs, as appropriate, for final action. Faculty within the GSN make curricular modifications and course changes incorporating student comments and suggestions. Major changes are referred to the GSN Curriculum Committee for oversight and approval. After changes are implemented, courses are conducted and evaluated again. The evaluation process is on-going as courses continually improve and students graduate with ever-enhanced preparation.

The GSN Designs, Revises, and Implements Evolving Tools for the Effective Measurement of Alumni Performance. Members of the Research and Evaluation Committee and faculty representatives from the Family Nurse Practitioner, Nurse Anesthesia, Perioperative Clinical Nurse Specialist, and Doctoral Programs design and implement tools to effectively measure alumni performance and to provide related reports to the GSN Dean and the Federal Nursing Chiefs. These assessment activities resulted in the publication of the GSN Evaluation Manual, in November of 2000, and are currently guiding the revision and update of the manual and evaluation tools, policies, and procedures. As national program standards and the GSN program objectives evolve, the GSN's outcome data collection tools and methods also change in order to collect data consistent with current standards and objectives. More extensive tracking is now possible among respondents to the surveys for graduates, alumni, and employers. In addition to rating performance levels for terminal objectives, graduating students, employers, and alumni are also asked to rate their level of satisfaction with other aspects of the GSN's programs and curricula. Accomplishments and employment following graduation are tracked through the one-year and three-year alumni surveys. End-of-program, alumni, and employer evaluation data, along with course evaluation data, are tabulated by the Evaluation Program Administrator and forwarded to the Research and Evaluation Committee for tracking and trending as well as to the Dean, Program Directors, and Department Chairs. Reviews of these reports by the GSN and the Federal Nursing Chiefs ensure that the GSN curricula meet the requirements of the Uniformed Services.

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USU GSN Graduates Hold Leadership Roles and Earn Special Recognition throughout the Uniformed Services - Selected Examples from the USU GSN Alumni.

"Deployed heroes don't have family members kiss them before they roll into the operating room or sit by their beds and listen. But we are there to talk to them; make sure they know someone cares. In the truest sense of the word, we are their family."

- **Major Susan Perry, CRNA, USAF, NC, GSN Class of 1998, Nurse Anesthesia,** Eifel Times, *Nurse Finds Peace While Tending Heroes*, Spangdahlem Air Base, Germany, January 23, 2004.

GSN Class of 1996.

Major Janet Bourne, USAF, NC, GSN Class of 1996, Family Nurse Practitioner, is serving as the Officer-in-Charge of the Student Health Clinic, 82nd Medical Operations Squadron, Sheppard Air Force Base, Texas. Major Bourne is a graduate of the Family Nurse Practitioner option in the GSN MSN Program.

Lieutenant Colonel Michele Levy, USAF, NC, GSN Class of 1996, Family Nurse Practitioner, is scheduled for assignment at the GSN to serve as a faculty member in the Family Nurse Practitioner Program in 2005.

Lieutenant Colonel Kelley Moore, CRNA, USAF, NC, GSN Class of 1996, Nurse Anesthesia, deployed in the Spring of 2003 to Southwest Asia in support of Operation Iraqi Freedom.

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GSN Class of 1997.

Major Adrienne Burnette Hartgerink, CRNA, USAF, NC, GSN Class of 1997, Nurse Anesthesia, was the author of an article featured in the Richmond Times-Dispatch in January of 2004; the article highlighted the role of the military Certified Registered Nurse Anesthetist. Major Hartgerink was deployed in support of Operation Enduring Freedom during 2002; in her article, she explained what it meant to her to serve her country in the unique and positive role of a military Certified Registered Nurse Anesthetist. Major Hartgerink served as the anesthesia component of a Small Portable Expeditionary Aeromedical Rapid Response (SPEARR) Team that was deployed to the Republic of the Philippines in support of Operation Enduring Freedom. Her experiences provide insight into the austere and often dangerous environments in which medical professionals must work during the continuing war on terrorism. Major Hartgerink joined the GSN as a faculty member in the Nurse Anesthesia Program, in 2004.

Lieutenant Colonel Nancy Heisterman, USAF, NC, GSN Class of 1997, Family Nurse Practitioner, left her position as Chief of Utilization Review at the David Grant Medical Center, Travis Air Force Base, California, to start a new Nurse Transition Program at Nellis Air Force Base, Nevada. The new program is part of the hospital's professional education department.

Major David Stamps, USAF, NC, CRNA, GSN Class of 1997, Nurse Anesthesia, was recognized for his expertise in casualty anesthesia care by being named to the faculty of the Expeditionary Medical Support (EMEDS) Course, USAF School of Aerospace Medicine, Brooks City-Base, Texas. The EMEDS Course is the state-of-the-art Air Force casualty care course that is attended by all deployed Air Force Medical Service personnel.

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GSN Class of 1998.

Major Rhonda Adler, USAF, NC, GSN Class of 1998, Family Nurse Practitioner, separated from the Air Force and her position as Element Chief of the Family Practice Clinic, 31st Medical Operations Squadron, Aviano Air Base, Italy, in July of 2004.

Lieutenant Commander Bradley Hartgerink, NC, USN, CRNA, GSN Class of 1998, Nurse Anesthesia, was deployed on the Hospital Ship *Comfort,* during 2003, in support of Operation Iraqi Freedom. While on the *Comfort*, Lieutenant Commander Hartgerink performed many anesthetics on both Iraqi prisoners and Coalition forces.

Colonel Bridget Larew, USAF, NC, GSN Class of 1998, Family Nurse Practitioner, moved from her previous position as the Medical Services Flight Commander at Bolling Air Force Base, Washington, D.C., in the Fall of 2004; she is currently drafting and implementing AE Policy at the Pentagon.

Lieutenant Colonel Terry McManus, USAF, NC, GSN Class of 1998, Family Nurse Practitioner, is currently serving as Element Leader in the Family Nurse Practitioner Clinic at Ramstein Air Force Base, Germany.

Major Susan Perry, CRNA, USAF, NC, GSN Class of 1998, Nurse Anesthesia, was deployed in the Winter of 2003 to Southwest Asia in support of Operation Iraqi Freedom where she successfully administered many anesthetics to critically wounded casualties under austere field conditions.

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GSN Class of 1999.

Captain Wendy Aronson, CRNA, USAF, NC, GSN Class of 1999, Nurse Anesthesia, was deployed in 2002 to Southwest Asia from Elemendorf Air Force Base. Setting up operations at an austere location, Captain Aronson pioneered the modification of EMEDS supplies resulting in significant savings of compressed oxygen, a rare commodity in an austere environment. Her efforts led to Air Force-wide recognition; and, as a result, she was appointed to the prestigious TriService Joint Readiness Clinical Advisory Board (JRCAB) at Fort Detrick, Maryland.

Major Alison (Solberg) Beach, USAF, NC, CRNA, GSN Class of 1999, Nurse Anesthesia, was deployed as the sole anesthesia provider at a classified location from February to April of 2003. Her deployment was in support of Operation Iraqi Freedom.

Major Jack M. Davis, AN, USA, GSN Class of 1999, Family Nurse Practitioner, was deployed as the Brigade Surgeon for the 17th Field Artillery Brigade in Balad, Iraq, in April of 2003; he is now serving at the Brook Army Medical Center in San Antonio, Texas.

Captain Heather Moledor (Johnson), USAF, NC, GSN Class of 1999, Family Nurse Practitioner, is currently serving as a Family Nurse Practitioner at Ramstein Air Base, Germany.

Major Brian Todd, CRNA, USAF, NC, GSN Class of 1999, Nurse Anesthesia, was deployed during 2002 to Southwest Asia, to include service in Oman. An expert in field equipment, he was one of the first USAF CRNAs to use specialized anesthesia equipment in an austere environment. Due to his expertise, he was named to the prestigious TriService Joint Readiness Clinical Advisory Board (JRCAB) at Fort Detrick, Maryland. The JRCAB establishes equipment policy for the Services. Major Todd also serves as a staff CRNA at the United States Air Force Academy, Colorado.

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GSN Class of 2000.

Major Julie Bosch, USAF, NC, GSN Class of 2000, Nurse Anesthesia, was deployed on a humanitarian mission for two weeks to Guatemala in June of 2002, where her clinical caseload was over 8,000 people. Major Bosch was relocated to Charleston Air Force Base, South Carolina, in June of 2003. Major Bosch has been accepted as a USAF Ph.D. candidate in the GSN Doctoral Program matriculating in 2005.

Captain Brian Estavillo, CRNA, USAF, NC, GSN Class of 2000, Nurse Anesthesia, was deployed to Southwest Asia during 2002. Captain Estavillo was with the Air Force Special Operations Command; he is currently a staff CRNA at Travis Air Force Base, California.

Captain Sandy McNaughton, AN, USA, GSN Class of 2000, Family Nurse Practitioner, will be returning to USU in June of 2005 as a faculty member in the GSN Nurse Practitioner option of the MSN Program.

Major Jim Sall, AN, USA, GSN Class of 2000, Family Nurse Practitioner, was accepted into the Ph.D. Program in Higher Education Administration at the University of Kansas, in mid-December of 2004. At the same time, he was named Chief of the Primary Care Clinic at Fort Leavenworth, which has 17 providers, the USDB (prison) Clinic, which has two providers, and a third satellite clinic in South Kansas City, with two additional providers. The providers include physicians, nurse practitioners, and physician assistants.

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GSN Class of 2001.

Captain Jen-Jen Chen, USAF, NC, GSN Class of 2001, Family Nurse Practitioner, was deployed to Tallil Air Base, Iraq, on November 13, 2003; he served there until mid-March of 2004.

Captain Virginia Johnson, CRNA, USAF, NC, GSN Class of 2001, Nurse Anesthesia, was deployed to Cyprus in the Spring of 2003, in support of Operation Iraqi Freedom. She successfully administered over seventy anesthetics.

Captain Geoffrey Kuzmich, CRNA, USAF, NC, GSN Class of 2001, Nurse Anesthesia, was deployed for six months to Yemen, Djibouti, and Qatar in support of Operation Iraqi Freedom. Captain Kuzmich successfully performed many anesthetics, including cases on critically wounded pediatric casualties in austere conditions. He was also selected as the Director, Anesthesia Services, for the Air Force Center for Sustainment of Trauma and Readiness Skills (C-STARS) at the University of Maryland R. Adams Crowley Shock Trauma Center in Baltimore, Maryland. Selected for his superb teaching skills and trauma anesthesia expertise, Captain Kuzmich replaced **Captain John Killpack, CRNA, USAF, NC, GSN Class of 1999.** Captain Killpack was the founding Anesthesia Services Director at C-STARS.

Captain Mikel Phillips, CRNA, USAF, NC, GSN Class of 2001, Nurse Anesthesia, was deployed from Wright-Patterson Air Force Base, Ohio, to Southwest Asia in January of 2003. Captain Phillips was lauded by his superiors for performing in a superior fashion under austere field conditions.

Captain Cherri Shireman, USAF, NC, Class of 2001, Family Nurse Practitioner, was selected by the Air Force Institute of Technology to return to school for a Ph.D. in Nursing. Captain Shireman began the Doctoral Program at the USU GSN in the Fall of 2004.

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Class of 2002.

Captain Curtis Aberle, AN, USA, GSN Class of 2002, Family Nurse Practitioner, serves as the Officer-in-Charge at the United States Army Health Clinic, Camp Bullis, in San Antonio, Texas.

Captain Toney Banks, USAF, NC, GSN Class of 2002, Nurse Anesthesia, is assigned to the 81st Medical Group, Keesler Air Force Base, Mississippi.

Captain Patricia F. Coburn, USAF, NC, GSN Class of 2002, Family Nurse Practitioner, returned from one year in Iraq; she departed just prior to the start of the war and was deployed for Operation Iraqi Freedom and Operation Enduring Freedom. She lost both of her grandparents, six months apart, during her one year deployment. Captain Coburn was part of a group that published an article in the *ANC Newsletter*, in 2004, where she stated the following: "Couldn't have chosen a better profession... Sincerely love my job and there is not a day that goes by where I'm not given an opportunity to help educate soldiers on health care issues."

Major Denise Lyons, AN, USA, GSN Class of 2002, Family Nurse Practitioner, is stationed at the Kimbrough Ambulatory Care Center, at Fort Meade, Maryland. She is also a member of the medical team for the Joint Alternate Communications Center.

Captain Angelo Moore, AN, USA, GSN Class of 2002, Family Nurse Practitioner, is currently stationed at the Landstuhl Regional Medical Center working as a Family Nurse Practitioner in the Family Practice Clinic. His other duties include Call for the Family Practice Clinic, Emergency Department, and Triage Officer for the Deployed Warrior Medical Management Center. He triages soldiers evacuated to the Landstuhl Regional Medical Center from Iraq, Kuwait, Afghanistan, and Africa and also backfills at other Army Health Clinics throughout Europe for providers who have been deployed. For example, he was in Italy in March of 2004 to conduct Post-Deployment processing and health screenings for units returning from Iraq. Captain Moore presented his thesis results with **Lieutenant Commander Gerald**

Boyle at the 2002 Meeting of the Association of Military Surgeons of the United States. In addition, he conducted a podium presentation at the 2003 American Academy of Nurse Practitioners Conference, in California. Captain Moore also published an article entitled *Health Practices of Male Department of Defense Health Care Beneficiaries: A Follow-Up on Prostate Cancer Screening in the National Capital Area* in the December 2003 issue of Military Medicine.

Captain Michael Neal, CRNA, AN, USA, GSN Class of 2002, Nurse Anesthesia, was deployed, just months after his graduation, to Southwest Asia during the Winter of 2003, in support of Operation Iraqi Freedom. Captain Neal was deployed to a busy Army Combat Support Hospital and successfully administered countless anesthetics to Coalition Forces, prisoners of war, and civilian casualties.

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Class of 2003

Captain Ilse Alumbaugh, AN, USA, GSN Class of 2003, Family Nurse Practitioner, is assigned to the United States Army Health Clinic at Schofield Barracks, Hawaii.

Captain Robert L. Herrold, AN, USA, GSN Class of 2003, Family Nurse Practitioner, was deployed to Iraq in support of Operation Iraqi Freedom. He is now serving in the United States.

Captain Eric Lange, AN, USA, GSN Class of 2003, Nurse Anesthesia, was part of a multi-disciplinary humanitarian team deployed to Honduras in February of 2003. Under the direction of **Lieutenant Colonel Jackie Stark, Walter Reed Army Medical Center (WRAMC) Nurse Anesthesia Clinical Site Director,** Captain Lange participated in a United States Southern Command, Humanitarian and Civic Assistance, Medical Readiness and Training Exercise. He was part of a WRAMC team that went to the Leonardo Martinez V. Hospital, an austere Ministry of Health hospital, located in San Pedro Sula, Honduras (a large industrial city located in the northwest corner of Honduras). The daily operations were similar to field conditions within a fixed facility. The team consisted of four surgeons, three anesthesia providers, two nurses, three surgical technicians, and one audiologist. The mission focus was exclusively the surgical treatment of chronic ear disease and fitting patients who received operations during previous missions with hearing aids to correct their acquired maximal conductive hearing loss. Under Lieutenant Colonel Stark's supervision, Captain Lange performed over twenty general anesthetics using the same anesthesia equipment that is currently being used in Iraq. Captain Lange commented: "What better experience to prepare a student for deployment... It was an awesome experience, both from a caring and from an educational perspective."

Captain Ann M. Nayback, AN, USA, GSN Class of 2003, Family Nurse Practitioner, is currently deployed to Iraq in support of Operation Iraqi Freedom.

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FACULTY

Composition. During 2004, the Graduate School of Nursing, as reported in the November 15, 2004 Faculty Listings Update, had 24 full-time faculty: thirteen civilians and eleven uniformed officers; and, two part-time civilian faculty. In addition, 71 off-campus/adjunct faculty (34 civilians and 37 uniformed officers) assisted in the programs of the GSN.

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The GSN Faculty Develops a Signature Curriculum. To support the GSN mission and address changing societal and health care needs, the GSN implemented a signature curriculum developed at the USU GSN Quarterly Retreat in August of 2002. The new curriculum is designed to support practice, research, and educational experiences relevant to medical readiness, the MHS, the USPHS, and other Federal Health Systems. The GSN curriculum is positioned to prepare nurse scientists and leaders at the graduate level, with an emphasis on the Nation's Uniformed Health Systems. The signature curriculum has three focused research and practice areas: *Operational Readiness in Changing Environments*; *Population Health and Outcomes*; and, *Clinical Decision-Making in the MHS, USPHS, and other Federal Health Systems*, with cross-cutting emphasis on patient safety, ethics, force protection, and international health.

Operational Readiness in Changing Environments.

Specific learning experiences related to operational readiness in the GSN core curriculum courses for all three programs are as follows:

Throughout the *Advanced Health Assessment Course*, operational readiness issues are addressed related to each body system. Basic principles of health assessment (percussion, auscultation, and palpation) are emphasized as is the fact that the student may be assigned in a remote location without the availability of advanced assessment technology. Techniques are introduced for performing assessments when the provider or patient is in nuclear/biological/chemical gear and for dealing with the cultural differences of patients of other nationalities. To help students transition into the role of the Advanced Practice Nurse (APN) in the military setting, the *Leadership Role in Interdisciplinary Health Care Course* discusses the experiences of recent graduates who have deployed on humanitarian and wartime missions. The *Ethics and Policy in Federal Health Systems Course* introduces students to ethical and health care policy issues in Federal and military practice. The course examines relationships among social, cultural, political, financial, clinical, and legal factors that influence health care delivery and public policy in the Federal health care systems and in contingency operations. Although nothing about pharmacology is unique to a field setting, the *Applied Pharmacology for the APN Course* emphasizes drugs that military APNs would be likely to frequently use and practical pharmacology including alternative agents to consider if a primary agent is unavailable in a field environment. The *Applied Pathophysiology for Advanced Nursing Practice Course* provides the students with in-depth presentations of those aspects of pathophysiology that are relevant to advanced practice nursing. The changes in physiological parameters occurring during the disease process are presented along with clinical correlations. An emphasis is placed on clinical cases that reflect military medical theaters of operations and on specific

organ system response to battlefield injuries. Medical conditions that occur in both military treatment facility care and field medicine include shock and hemostasis, infectious diseases, pneumonia, diarrhea and hematologic disorders. The *Leadership and Management in a Global Environment Course* discusses principles of leadership, collaboration, conflict management, negotiation and power related to the role of the APN within austere environments.

Six two-hour *Operational Readiness Seminars* are interwoven with the first year of the GSN program. These seminars teach the military unique skills and information necessary to support the mission during deployments. Some of the topics covered include the National Response Plan, the National Disaster Medical System, national security and military strategy, nursing perspectives on medical evacuation, pain management, provider combat stress, and lessons learned from deployment.

- **USU Board of Regents,** Report to the Secretary of Defense, *Graduate School of Nursing Curriculum*, June 22, 2005, pages 11-12.

Graduates from the University often deploy to, and provide care in support of, geopolitical events including war, national and man-made disasters, peacekeeping missions, and humanitarian assistance. The ability to function effectively is dependent on the flexibility to adapt to changes in climate, culture, and mission. The operational readiness pillar of the GSN provides the necessary framework to prepare students to manage clinical, administrative and leadership demands specific to the mission during deployment.

Population Health and Outcomes. Population health refers to an approach to improve the health of a population and to reduce health inequities among population groups. The objective of population health is to examine and take action on a broad range of factors and conditions that influence health. The population health approach recognizes that health is a capacity or resource rather than a state, a definition, which corresponds more to the idea of being able to pursue one's goals, to acquire skills and education, and to grow. The broader notion of health recognizes the range of social, economic and physical environmental factors that contribute to health; the clear articulation of this concept of health is *the capacity of people to adapt to, respond to, or control life's challenges and changes*. Outcome evaluation is essential in a population health approach. It examines long-term changes in both health and the determinants of health. These include changes in knowledge, awareness and behavior, shifts in social, economic and environmental conditions, as well as changes in public policy and health infrastructure. Outcome evaluation seeks to measure reduction in health status inequities between population sub-groups. Longer-term outcome evaluation is essential for a comprehensive evaluation program, which also includes process evaluation (to determine whether a policy or program is meeting its goal and reaching its target population) and impact evaluation (to determine the affects of a program on the health of a population).

Clinical Decision-Making in the MHS, USPHS, and other Federal Health Systems. In the MHS, USPHS, and other Federal Health Systems, clinical decision-making includes the coordination of patient care services across the Nation to optimize the delivery of health care to recipients. Ensuring seamless care across the health care continuum requires a unique understanding of health issues and the complexity of integrating the services of the largest health care systems within the United States (the MHS and VA Medical Systems). The GSN curricula provide uniformed students with a framework to effectively function both clinically and administratively in the MHS, USPHS, and other Federal Health Systems.

Three Categories of Courses. Regardless of program specialty, all GSN students will graduate with an advanced understanding of Operational Readiness, Population Health and Outcomes, and Clinical Decision-Making in the MHS, USPHS, and other Federal Health Systems. Cross-cutting emphasis will be placed on concepts related to *leadership*; *national and international political, cultural and environmental health care factors*; *safety*; and, *research*. At each nexus point (i.e., leadership and operational readiness; leadership and clinical decision-making; and, leadership and population health and outcomes) the content will be tailored to the level of the student. For example, when leadership and operational readiness concepts are first introduced, they will be offered at Level 1, forming a foundational knowledge base. Level 2 concepts will then be introduced, forming a more complex understanding of leadership and operational readiness; and, finally, highly advanced (Level 3) concepts will be introduced. Uniformed students will emerge from the GSN programs and return to the Uniformed Services workforce with a unique and highly complex understanding of: Operational Readiness; Population Health and Outcomes; and, Clinical Decision-Making in the MHS, USPHS, and other Federal Health Systems.

The process of integrating the GSN signature curriculum was made more complex with the concurrent addition of the MSN Degree in the Clinical Nurse Specialist track. Because the role of the clinical nurse specialist is different from the roles of the family nurse practitioner and the nurse anesthetist, the GSN had to reconsider the focus and content of many of its existing core courses. Clinical nurse specialists differ in that their role is broader, spanning from the individual patient to the hospital system. Thus, the new GSN curriculum focuses on systems and population health *in addition to* the traditional care of the individual patient.

In order to address this new focus, the GSN curriculum task force first reviewed the AACN *Essentials of Master's Nursing Education* criterion. The following definitions were taken directly from the AACN *Essentials* document and have been adopted by the GSN as framing definitions for the three categories of courses taught within the GSN.

Graduate Nursing Core: Foundational curriculum content deemed essential for all students who pursue a Master of Science in Nursing Degree, regardless of specialty or functional focus, is considered the Graduate Nursing Core. The Graduate Nursing Core Courses include the following: Role, Role/Ethics/ Public Policy, Research, and Healthcare in a Global Environment.

Advanced Practice Nursing Core: Essential content for providing direct patient/client services at an advanced level will be considered the Advanced Practice Nursing Core. The Advanced Practice Nursing Core Courses will include Health Assessment, Anatomy/Physiology, Pathophysiology, and Pharmacology.

Specialty Curriculum Content: Those clinical and didactic learning experiences identified and defined as essential by the specialty nursing organizations will be considered the Specialty Curriculum Content.

Using these criteria as a framework, all of the GSN courses currently being taught were critically examined. The GSN faculty determined that all master-prepared students should complete the courses identified within the Graduate Nursing Core. And, because the GSN graduates must be able to provide direct patient care in the MHS and USPHS, all GSN students are also required to take the courses identified

within the Advanced Practice Nursing Core.

Over the past two years, all GSN (core and specialty) courses have been carefully reviewed, and revised as appropriate, in order to integrate the new GSN curriculum. The GSN faculty, in coordination with the Federal Nursing Chiefs, gradually transitioned into providing the new core curriculum rather than implementing all of the required changes at once. The new GSN curriculum was put in place during the Summer of 2004; the December 23, 2004 iteration of the Signature Curriculum, Structures and Sub-concepts follows.

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Graduate School of Nursing

Uniformed Services University of the Health Sciences

Signature Curriculum
Structure and Sub-concepts

	Operational Readiness In The Changing Environment	Clinical Decision Making In The Federal Health Care Delivery System	Population Health And Outcomes
Safety	• Force Health Protection • Force Health in WMD • Patient Safety in Austere Environments • Standards of Care • Self care of the Force	• Patient Safety • Workforce Safety • Standards of Practice • Error Reduction	• Population Risk Identification and Cost Effective Interventions • Reduction of Costly Errors Without □ Outcomes • Targeting Populations at Risk
Global/ Environmental, Cultural, political	• Austere Environment/ Survey • Host Nation Issues • Preparation for Global War on Terrorism • Ethics in Host Nations • Policy Issues	• Ethics and Global Health • Care of Culturally Diverse Populations • Federal Health Care Policy Development • Autonomous Practice	• Culturally Unique Health Problems • TRICARE Policy • Medicare • Families Across the Life Span • Economics and Cost
Evidenced Based Practice/ Research	• Infectious Disease Management (WMD) • Functioning in Protective Gear • Women's Health and Deployment	• Health Promotion/ Disease Prevention • Patient Safety • Research to Inform Practice • Basic Science	• Designing and Testing Standards of Practice to Achieve Population Health Outcomes • Disease and Chronic Problem Management • Life Span Care • Health Economics • Quality of Life Issues • Research Process • Health Promotion • Ethics
Leadership/ Support	• Integration with Federal Agencies/NGOs • Supply/resource Management • Multi-disciplinary Collaboration with Communities for Homeland Security	• Interdisciplinary Collaborative Practice • Supply/resource Management • Professional Role/ Consultant • Professional Military Role • Communication Skills	• Policy Analysis and Resource Management • Leadership in Homeland Security for Populations at Risk • Public Health and Epidemiology Competence • Communication
Impact of Technology	• Resource Identification • Exploration of Advantages and Disadvantages for Use • Limitations • Ethical Issues related to Use • Role Development	• Facilitation of Decision Making • Distance Technology for Education and Training • Telemedicine/ Telehealth	• Improving Outcomes • New Methods for Statistical Analysis and Data Management • Privacy Concerns/Issues

Department Structure: Background and History.

A New Structure. Prior to 2003, programmatic and faculty development responsibilities belonged to the FNP and CRNA Program Directors. This structure limited the GSN's ability to respond rapidly to programmatic changes; and, faculty needs were subordinate to curriculum and student requirements. The GSN has transitioned to a structure where the functions of the programs and faculty development needs are separate. During the 2002/2003 Academic Year, a Faculty Structure Task Force (FSTF) was formed; in December of 2002, the FSTF submitted the following guidelines:

1) Establish two departments. The FSTF determined that two departments would best meet the needs of the GSN, adding a third department as the GSN grows;

2) Ensure equity of faculty across the two Departments. Each department should receive an equivalent number of researchers, clinicians, uniformed officers, and civilian faculty; and,

3) Designate Department Chair responsibilities to include: supporting faculty promotion and career progression goals (*focus faculty efforts on meeting/exceeding CAPT promotion criterion*); ensuring workload equity; facilitating faculty research; supporting orientation and mentoring of new faculty; monitoring and reporting on faculty input; producing an annual report to include: clinical practice hours; committee service; and, community service.

Implementation of the new structure began in August of 2003; the first Department meetings were held in October of 2003.

Research Topic Clusters by Department.

Health Systems, Risk, and Contingency Management

-Outcomes-oriented research based on systems intervention(s);
-Risk anticipation and management;
-Cultural/geopolitical assessment for education/training;
-Provider functioning in austere environments;
-Infectious Disease Surveillance;
-Public health in global terrorism;
-Mission-oriented protective posture gear research;
-Patient safety systems interventions;
-Interdisciplinary management of bioterrorism situations at home and abroad;
-Population health management;
-Health education for operational readiness in a global terrorism environment; and,
-Technology in health systems.

Health, Injury, Disease Management

-Outcomes-oriented research based on individualized interventions;
-Outcomes-driven clinical interventions for disease management of populations;
-Processes of care and intervention research;
-Prevention and health promotion;
-Force health protection/screening;
-Culturally competent care assessment;
-Individualized health care outcomes;
-Care of individuals in austere settings;
-Health/safety/readiness of personnel and families;
-Individual management in terrorism;
-Using technology for individual health care interventions; and,
-Risk Assessment and screening.

Department Faculty. Diversity of faculty across the two Departments was an overarching goal when the department structure was instituted. Current structure reflects that diversity and equity of faculty assignment across the two Departments has been accomplished.

Scholarship of Teaching. All faculty in the two Departments teach across programs at both the masters and/or doctoral levels, with the majority of the faculty serving as course coordinators during all three semesters (Fall, Spring, Summer). Two faculty from each Department serve as Program Directors.

Scholarship of Practice. The five faculty members in each Department practice approximately one half to one full day each week in military treatment facilities within the National Capital Region. This voluntary service contributes to USU's generation of cost avoidance for the DoD, while maintaining the faculty's clinical skills.

Scholarship of Research. Twelve faculty members are currently involved in active research projects.

Scholarship of Publication/Presentation. Dissemination of knowledge relevant to clinical practice, including relevant research, continues to be a goal of the GSN faculty. During 2004, approximately 16 articles were either accepted for publication or were published. In addition, the majority of the faculty provided poster or podium presentations at regional, national, or international conferences. (*Examples of publications and presentations during 2004 are provided at Appendix C.*)

Scholarship of Service. The GSN faculty is well represented across the GSN and USU committees. Two GSN faculty members were appointed to the USU Presidential Search; one GSN faculty member chairs a USU committee; and, one is a member of the USU Faculty Senate.

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GSN Faculty Members Are Recognized for Integration of Technology Throughout the GSN Curricula. Since its inception, the GSN has actively participated in educational and research activities at the National Capital Area Medical Simulation Center (SIMCEN). Over the past five years, the GSN faculty has collaborated with the SIMCEN faculty and staff to enhance the GSN programs through: the development of clinical cases utilizing the SIMCEN technology; presentations of the use of SIMCEN technology in education at the national level; and, SIMCEN-related research activities. This active participation has been widely recognized; for example, the Dean of the GSN and the GSN faculty were invited to participate in high-level strategic planning sessions, during 2003, as the University reviewed its use of resources and support for the SIMCEN. In addition, the GSN was invited to present its SIMCEN-related technology initiatives for both its curriculum and research to the Centre for Medical Education located at the University of Dundee, Scotland (the Centre's leader, Doctor Ron Harden, is recognized as an expert in international medical simulation). In December of 2002, GSN faculty were invited to meet at the SIMCEN with members of the University of Michigan Consortium to discuss collaborative activities and possibilities for the future forging of technology/SIMCEN links among the disciplines of medicine, nursing, veterinary science, and dentistry. As noted in 2002, by the Evaluation Team from the Commission on Collegiate Nursing Education:

> **A state-of-the-art simulation center is available to the GSN and is equipped with 12 fully equipped patient treatment rooms with computer, video, and audio equipment. In addition, the simulation center has a distance education teleconference room, a computer laboratory, and an operating room simulation laboratory with manikin simulators and anesthesia equipment, which mimics that used in the military field. Virtual reality anatomy lectures are cutting edge and are available for approximately four anatomic systems. GSN students interviewed verbalized knowledge of the many resources available to them on campus and had overwhelmingly positive comments about the laboratories, libraries, simulation center, and virtual reality programs available to them for study.**

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The Establishment of a University Distant Education Policy. On November 6, 2001, following extensive coordination, the USU President approved a comprehensive Distant Education Policy, PPM-004-2001, for the University. The guidelines provided in the policy apply to courses and activities initially designed in the distance learning format as well as to courses and activities in which the method of delivery has changed significantly from that approved in the original curriculum proposal. The courses in distance learning may be either certificate courses or in conjunction with degree granting programs. Any department or faculty group offering distance education courses is expected to meet the recommendations of the Middle States Association of Colleges and Schools and five other accrediting groups for Distance Education Programs, dated March 23, 2001, and be guided by policies established by the USU. The text of these guidelines is made available at <*http://www.wiche.edu/telecom/Article1.htm*> by the Chronicle of Higher Education. The current USU Distant Education Policy includes basic education principles, guidelines on the implementation of those principles, and identification of the responsibilities of all who are involved in distance education at the University.

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Blackboard Acquisition.

The acquisition of a web-based *learning platform* was a significant milestone in the history of the GSN. From the very first discussions reference the establishment of a Doctoral Program at the GSN, it was envisioned that the program would be heavily web-supported. Students applying and being accepted to the GSN Doctoral Program are a unique group of Federal Nurses. As a cohort, they are senior-ranking uniformed officers (0-4 and higher) with demanding positions in their health care systems. Those students choosing the part-time option understand that they are making a five-year commitment to the GSN and their graduate studies. Over that five-year span, the GSN anticipates that many of its part-time students will be transferred out of the National Capital Region; and, they will require consistent communication with the GSN via technology. From the inception of the Doctoral Program, the GSN has been actively working toward the acquisition of a robust, web-based distance learning platform. As a major component, the platform has to support interaction between faculty and students; it can not simply serve as an archival site for the storage of documents. Following a competitive procurement process, the GSN acquired the ***Blackboard Learning Platform***.

Initial faculty, staff and administrative training was conducted on January 12 and 13, 2004. By June of 2004, the first doctoral course was web-enhanced and pilot-testing within the masters curriculum began. By the Summer of 2005, it is anticipated that all of the doctoral courses and many of the masters-level courses will be web-enhanced. Careful attention is being paid to the standardization of the *look and feel* elements of the portal and class interfaces so that students can quickly and easily navigate through the system, following their orientation with the Blackboard platform. Tutorials for both faculty and students are under development; and, on-going administrative training is underway.

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Leadership of the GSN.

Faye Glenn Abdellah, Ed.D., Sc.D., RN, FAAN, Professor and Founding Dean Emerita. The Founding Dean of the Graduate School of Nursing, **Doctor Faye Glenn Abdellah,** has long been recognized as a national pioneer in nursing, nursing research, long-term care policy, mental retardation, the developmentally disabled, home health services, aging, hospice and AIDS. She has been the recipient of 12 honorary degrees, over 90 major awards, authored or co-authored more than 152 publications, and authored six books, some translated into six languages, which have altered nursing theory and practice. Prior to assuming the post of Founding Dean, Rear Admiral Abdellah (0-8), United States Public Health Service, served as the Chief Nurse Officer and Deputy Surgeon General of the United States from 1981 until her retirement in 1989 (for more detail on Dean Abdellah's accomplishments, see Section I of the USU Journal, *USU Honorary Degrees* and the *University Medal*). On May 31, 2002, Dean Abdellah celebrated her retirement from USU with distinguished participants including the University President, the Federal Nursing Chiefs, the Commanding Officer of the National Naval Medical Center, a former Surgeon General of the United States, senior Congressional staff, civilian nursing leaders, and over three hundred members of the USU community. Significantly, she also led the GSN in preparing for, and ultimately receiving, full accreditation for the maximum allowable terms from the National League for Nursing Accrediting Commission (NLNAC) and the Commission on Collegiate Nursing Education (CCNE). Before her retirement, she ensured that the preparation for reaccreditation by the American Association of Nurse Anesthetist Council on Nurse Anesthesia (COA) was well on track. Dean Emerita Abdellah submitted

a paper entitled, *Military Nursing Research by Students at the Graduate School of Nursing Uniformed Services University of the Health Sciences* (co-authors: Eugene Levine, Ph.D.; Barbara Sylvia, Ph.D.; Commander Patricia W. Kelly, USN; CAPT Virginia Saba, USPHS (Ret.); and, Samantha Tenenbaum) to Military Medicine; it was subsequently published during 2005.

Patricia A. Hinton Walker, Ph.D., RN, FAAN, Professor and Dean. Following an extensive national search, **Doctor Patricia Hinton Walker** was selected, in June of 2002, to serve as the second Dean of the GSN. Dean Hinton Walker is nationally recognized as a leader in education and has been a strong advocate for health services research, specifically measuring cost and quality outcomes. After serving as the Dean of the Nursing School at the University of Colorado Health Sciences Center, Doctor Hinton Walker was selected as the American Academy of Nurses Senior Scholar in Research at the Agency for Healthcare Research and Quality (AHRQ) where she coordinated the extensive review of funded health sciences research used in determining health policy. During her distinguished career, Dean Hinton Walker served as an Associate Dean at two major research universities; a visiting professor in community based-care; a director of an entrepreneurial community-based practice organization; and, as a consultant on quality and cost-effective outcomes, faculty practice and community-based care, managed care, practice-based research, and organizational development in hospitals and schools of nursing. In addition to her more than 30-year teaching career, she has authored five books on nursing education and practice as well as 49 peer-reviewed professional articles. She has been recognized by the most prestigious organizations in the nursing profession. Her honors and awards include: the Distinguished Alumni of the Year by the University of Kansas Medical Center Nurses Alumni Association (1998); Who's Who in American Nursing (1993); Nurse of the Year for the Mississippi Nurses Association District #13 (1980); Member of the Board of Directors, Friends of the National Institute for Nursing Research, from 1998 to the present; and, recipient of international invitations on educational consultation from the United Kingdom, Hong Kong, Thailand, Japan, Belgium, Poland, Spain, Sweden, and many others. Dean Hinton Walker's expertise in interdisciplinary practice, education, research, and health policy will ensure the continued progress of the GSN. She will continue her involvement in the nursing agenda at the AHRQ as a senior advisor with a focus on quality outcomes. Opportunities for research in the MHS, USPHS, and other Federal Health Systems will be utilized by the new GSN Dean for studying the areas of prevention, health promotion, and patient safety. Dean Hinton Walker understands the potential impact on policy that nursing research can have and will foster this through the development of a doctoral program. A dedicated believer in utilizing internal motivation, Dean Hinton Walker sees educators as people who guide learners toward missions or areas of interest rather than prescribing courses of action. She also advocates for exploring alternative means of learning, such as through the Internet. Following her arrival at the GSN in mid-2002, Dean Hinton Walker has carefully led the GSN faculty and staff through a transition period utilizing new initiatives and concepts to analyze systems, review curriculum, and enhance program development. Dean Hinton Walker's goal is a shared vision of the GSN that is flexible, responsive, and on target with the needs of the Uniformed Services. Her vision is to continue to optimize the strengths and interests of the GSN faculty and staff, to enhance the research infrastructure, to continue the merging of technological advancements into the curriculum, and to support the provision of a flexible curriculum that addresses the educational requirements of the Uniformed Services, while ensuring that the infrastructure sufficiently supports both faculty and students.

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Selected Profiles of Graduate School of Nursing Faculty.

Outstanding Uniformed Faculty Award for the MSN Program. Lieutenant Colonel (P) Bruce Schoneboom, Ph.D., CRNA, USA, Associate Professor, was selected by the GSN masters degree students to receive the Outstanding Uniformed Faculty Award at the May 2004 Graduation. The GSN masters students chose LTC Schoneboom as the uniformed faculty educator who exemplified the highest qualities of a graduate nursing educator by personal example and performance.

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Outstanding Civilian Faculty Award for the MSN Program. Tom Kaufman, Ph.D., was selected by the GSN masters degree students at the last Commandant's Call to receive the Civilian Faculty Award at the May 2004 Graduation. The GSN masters students selected Doctor Kaufman as the civilian faculty educator who displayed the highest qualities of a graduate nursing educator by personal example and performance.

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Outstanding Uniformed Faculty Award for the Doctoral Program. Colonel Martha Turner, USAF, NC, RN, CNAA, Ph.D., was voted "Uniformed Faculty of the Year" by the GSN doctoral students. The GSN doctoral students selected Colonel Turner as the uniformed faculty educator who displayed the highest qualities of a graduate nursing educator by personal example and performance.

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Outstanding Civilian Faculty Award for the Doctoral Program. The doctoral students voted **Linda Yoder, Ph.D., MBA, RN, FAAN, Associate Professor,** "Civilian Faculty of the Year." The GSN doctoral students selected Doctor Yoder as the civilian faculty educator who displayed the highest qualities of a graduate nursing educator by personal example and performance.

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GSN Graduation Marshall for 2004. Lieutenant Colonel Reynold Mosier, MSN, CRNP, USA, Assistant Professor, was selected to serve as the GSN Graduation Marshall during the 2004 Commencement Ceremonies at Constitution Hall.

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2004 Dean's MSN Program Teaching Awards. Lieutenant Colonel (P) Linda Wanzer, MSN, AN, USA, Assistant Professor, was the uniformed officer selected to receive the Dean's MSN Program Teaching Award for 2004; **Diane Seibert, Ph.D., CRNP, Assistant Professor,** was selected to receive the civilian 2004 Dean's MSN Program Teaching Award.

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2004 Dean's Doctoral Program Teaching Awards. Colonel Martha Turner, USAF, NC, RN, CNAA, Ph.D., was the uniformed officer selected to receive the Dean's Doctoral Program Teaching Award for 2004; **Linda Yoder, Ph.D., MBA, RN, FAAN, Associate Professor,** was selected to receive the civilian 2004 Dean's Doctoral Program Teaching Award.

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2004 GSN Faculty Research Awards.

2004 Emerging Investigator Awards. The 2004 Emerging Investigator Awards were presented to **Colonel (s) Paul Austin, USAF, Ph.D., CRNA, Associate Professor,** and **Diane Seibert, Ph.D., CRNP, Assistant Professor**. These awards recognized the uniformed and civilian GSN faculty whose efforts displayed the highest qualities in graduate nursing research.

2004 Faye Glenn Abdellah Faculty Research Award. The Faye Glenn Abdellah Faculty Research Award was presented to Laura Talbot, Ph.D. EdD., RN, CS, Associate Professor.

2004 Clinical Scholar. **Lieutenant Colonel Reynold Mosier, MSN, CRNP, USA, Assistant Professor,** was selected as the GSN 2004 Clinical Scholar.

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GSN Faculty Service Awards.

2004 Interdisciplinary Contribution Awards. **Colonel Charles Serio, USA, USU Brigade Commander,** and **Edmund G. Howe, III, M.D., Professor of Psychiatry,** were selected by the GSN to receive the 2004 Interdisciplinary Contribution Awards.

2004 GSN Faculty Esprit de Corps Award. **Karen Elberson, Ph.D., RN, Associate Professor,** was chosen to receive the 2004 GSN Faculty Esprit de Corps Award.

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New Associate Dean for Academic Systems Selected in 2004. Colonel John S. Murray, USAF, NC, Ph.D., CPNP, CS, FAAN, Professor, was selected by the Dean to serve as the GSN Associate Dean for Academic Systems. He is the first uniformed nurse in the Department of Defense to be appointed as a Professor at USU. Colonel Murray fills a position that had been previously covered by two Acting Associate Deans following the transfer, in January of 2003, of **Colonel Martha Turner, USAF, NC, RN, CNAA, BC, Ph.D., Associate Dean for Academic Systems**; Colonel Turner assumed the leadership position for the International Studies Program in the USU School of Medicine Department of Preventive Medicine and Biometrics. **Patricia C. McMullen, DNSc, JD, CNS, CRNP, Associate Professor,** filled this role in an acting capacity following the departure of Colonel Turner until the Summer of 2003, when she accepted an Associate Dean position at Catholic University. Next, **Karen Elberson, Ph.D., RN, Associate Professor,** served in an acting capacity until the arrival of Colonel Murray. Colonel Murray is highly qualified for the position and will add to the leadership, academic, and research capabilities of the GSN.

Colonel Murray transferred to USU from the Office of the Air Force Surgeon General, where he completed an executive leadership fellowship. He has served as the Consultant to the Surgeon General for Pediatrics and currently serves as the Consultant for Clinical Research. Colonel Murray was recently appointed by the Assistant Secretary of Defense for Health Affairs to serve as the DoD Representative to the National Advisory Council for Research at the National Institutes of Health. He was also just appointed by the Department of State to work with the American Academy of Pediatrics Section on International Child Health to develop a health care delivery plan for children affected by the Tsunami Disaster in South Asia. As an active researcher in the care of siblings of children with cancer and children with chronic illnesses, Colonel Murray is the principal investigator on a Congressionally-funded grant that totals more then $3.2 million; he has been the recipient of a total of $15 million in grant funding. Colonel Murray, who has held office and completed board service in many professional societies, is a Fellow in the American Academy of Nursing, where he has the distinguished honor of being the youngest nurse ever selected. The American Academy of Nursing is comprised of nurse leaders who are at the top of their profession, having accomplished extraordinary milestones in their nursing careers. Colonel Murray has written over 25 peer-reviewed journal articles and two book chapters; he is the author of the book, Cancer Affects Me Too: A Workbook for Siblings of Children with Cancer. As a result, Colonel Murrary is the recipient of the International Association of Pediatric Oncology Nursing Author of the Year Award. He currently serves on the editorial boards of several nursing and research journals. In addition, Colonel Murray is the recipient of numerous national and international awards. In 2004, he received the University of Texas at Austin School of Nursing Outstanding Alumni Award. ***He was recognized by former President Bill Clinton and the International Congress on Pediatrics for his humanitarian work in developing countries.*** He authored the first-ever Pediatric Health Care Delivery Plan for Humanitarian Missions in Developing Countries. And, ***President George W. Bush, along with the National Institute of Child Health and Human Development, recognized Colonel Murray for his childhood cancer research***, which has been replicated in eight countries around the world. ***Colonel Murray was also awarded the United States President's Award for Excellence in Health Care for his work with children following the events of September 11, 2001***.

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New Commandant for the GSN in 2004. Lieutenant Colonel (P) Constance J. Moore, USA, AN, MSN, RNBC, Assistant Professor, was selected by the Dean to serve as the GSN Commandant and Assistant Dean for Student Services. She replaced **Lieutenant Colonel Regina Tellitocci, USA,** who was reassigned to the Walter Reed Army Medical Center in June of 2003, and Major Sherry McAtee, USAF, who served as Interim Commandant until LTC Moore reported for duty in October of 2004. Colonel Moore is highly qualified for the position and will add to the leadership, educational, and military capabilities of

the GSN faculty. LTC Moore served as the Army Nurse Corps Historian at the Center for Military History in Washington, D.C., from 1994-1997. She has held clinical and leadership positions in Army community hospitals, such as: Deputy Psychiatric Nursing Course Director at the Dwight David Eisenhower Army Medical Center, Fort Gordon, Georgia, from 1997-2000; Deputy Chief of Nursing Education and Staff Development at the Walter Reed Army Medical Center from 2000-2002; and, Director of the PNC at the William Beaumont Army Medical Center from 2002-2004. During these assignments, LTC Moore has developed and implemented professional programs that have had significant impact on the clinical skills and professional identification across her nursing corps. She is well known as a clinical expert in Army psychiatric care and has been recognized for her performance during a strategic mobilization assignment caring for Cuban refugees at Guantanamo Bay, Cuba. She also served as a grief counselor at the Pentagon for two months following the attack of September 11, 2001. Highly respected throughout the military community, she provided an astute clinical assessment following a critical incident, which impacted the highest levels of a sister Service. LTC Moore's most enduring professional contributions to the advancement of professional nursing knowledge occur through her extensive research, publications, and presentations on nursing history. Throughout her career, regardless of formal assignments, she has channeled a passionate avocation into a body of knowledge that both inspires and invigorates those with whom she works. As the Army Nurse Corps Historian, she set the standard for excellence through the use of her psychiatric nursing interview skills and her academic mastery of history. Her extensive research endeavors include in-depth oral histories of more than 20 Army nurses. LTC Moore's active involvement in professional and community organizations clearly indicates her commitment to nursing history. She is a long-time member of Sigma Theta Tau, the international honor society for nursing, and the American Psychiatric Nurses Association. LTC Moore served as an officer of the American Association of the History of Nursing from 1989 to 1991. As an active member of the Women in Military Service to America, she serves as the historical consultant for the organization's official programs. LTC Moore has volunteered significant time as a peer assistance counselor for the Texas Board of Nursing to ensure that impaired nurses who are returning to practice receive appropriate support during their reentry. She spends countless hours with senior retired officers, archiving their personal experiences, which will serve as insight and inspiration for future generations. Moreover, she was also selected as one of seven national subject matter experts by the American Nurses Credentialing Center to write test questions for the Nursing Professional Development Credentialing Examination.

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Associate Dean of Faculty Affairs. Karen L. Elberson, Ph.D., RN, Associate Professor, joined USU in July of 2003; she departed from East Carolina University where she had served in a variety of leadership positions (Chair, Adult Health Nursing Department; Director, Information Systems, School of Nursing; Chair, Admissions, Promotion and Tenure Committee; and, Liaison for Research). Prior to her tenure at East Carolina University, she served on the faculty at Emory University, Nell Hodgson Woodruff School of Nursing where she taught Adult Health Critical Care Nursing; she also taught in and served as the Interim Director of the Nursing Service Administration Program. Upon her arrival at USU, Doctor Elberson served as the Acting Associate Dean for Academic Systems and Faculty Affairs until the arrival of Colonel John Murray. Currently, Doctor Elberson holds the position of Associate Dean, Faculty Affairs, as a tenured Associate Professor. In addition, she serves as the Director of the GSN Ph.D. Program.

Doctor Elberson was selected to serve on the University Presidential Search Committee, during the past year. She is also the Chair of the GSN Student Promotion Committee; and, she serves in an *Ex Officio* capacity on the Committee on Appointments, Promotions, and Tenure (CAPT). She was instrumental in the coordination processes for the revision and approval of the GSN portion of the USU CAPT Instruction.

The revised CAPT document provides a mechanism for recommending ranks above Assistant Professor for military faculty who meet the criteria for Associate Professor/Professor. She also serves, or has served, as a member of the Graduate Curriculum Committee; the Space Committee; and, the Continuing Health Education Committee. In addition to serving on these Standing Committees, Doctor Elberson has served on numerous task forces (orientation, faculty workload, authorship, mission/vision, etc.). Doctor Elberson's research interest is in Health Promotion and Disease Prevention, especially in the area of cardiology and fitness. Her past research has dealt with mobility, heat response in migrant farm workers, and distance education. She has authored/co-authored several research articles. In particular, a co-authored article on prodromal and acute symptoms of myocardial infarction in women received national and international recognition. She submitted a grant proposal on the topic of the *Longitudinal Impact of Glucose Tolerance on Sarcopenia* to the National Institutes of Health, in January of 2005. She recently co-authored a publication entitled, *Collaboration: Leadership in a Global Technological Environment*, in a refereed on-line journal and has three additional manuscripts accepted for publication, during 2005. In February of 2005, Doctor Elberson was an invited Keynote Speaker at a leadership conference held in Sydney, Australia. Other leadership-related roles include her service on the Leadership Succession Committee for the Sigma Theta Tau International (STTI) Honor Society of Nursing and on the Nominating Committee of the GSN Tau Theta Chapter of STTI. She spearheaded a silent auction for Tau Theta that resulted in a total of $3,000, which will be allocated in support of a newly established Research and Scholarship Fund for the Chapter. Further, she has been invited to serve as one of the Founder's Awards Judges for STTI.

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GSN Acting Chair of the new Department of Health Systems, Risk, and Contingency Management (DHSRCM), Diane C. Seibert, Ph.D., CRNP, Assistant Professor, has research interests in genetics, women's health, and in technology-assisted learning. Doctor Seibert served as the Task Force Leader for the GSN Faculty Structure Task Force. In 2004, she received both the GSN Dean's Teaching Award and the Emerging Researcher Award.

Doctor Seibert was instrumental in the successful deployment of two ten-day genetic intensive courses for nurses, in the Spring of 2004. As a result of this collaborative effort, she was invited to speak on the topic of genetics and present her findings at several major conferences. She and two other faculty members from the Washington, D.C. Metro Area presented a 90 minute podium session on integrating genetics into APN curricula at the April 2004 NONPF Conference, held in San Diego, California. Doctor Seibert and a collaborative colleague, Doctor Fries, were invited to present their *Genetic Intensive Initiative* at a podium session during the October 2004 Armed Forces District Meeting of the ACOG/AWHONN in San Diego, California. Abstracts for poster presentations on the *Genetics Intensive Initiative* were accepted at the ISONG Meeting in Toronto, Canada; the AMSUS Meeting in Denver, Colorado; the NCHPEG Meeting in Bethesda, Maryland; and, the TRICARE Conference held in Washington, D.C. In January of 2005, Doctor Seibert was invited to participate in a working group to assist in the development of a document entitled, *Minimal Nursing Competencies and Curricula Guidelines for Genetics and Genomics*. Her abstract entitled, *Implementing the ACOG Cystic Fibrosis Screening Recommendations: What Nurse Practitioners Need to Know*, has been accepted for a podium session at the June 2005 AANP Meeting in Fort Lauderdale, Florida. She has been invited to write a chapter on the Genetics & Ethics of Cystic Fibrosis for an American Nurses Association Monograph and to present a concurrent session at the November 2005 ISONG Meeting to be held in Salt Lake City, Utah. Finally in February of 2005, Doctor Seibert was invited to consult with Michigan State University on implementing performance assessment through the use of simulated/standardized patient encounters.

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Barbara M. Sylvia, Ph.D., RN, Professor and Chair of the new GSN Department of Health, Injury, and Disease Management, Former Chair of the GSN Department of Research, has been involved in several funded research projects. As the principal investigator on a USU intramural funded project, she extended her work on prenatal care for military women from an earlier project funded by the TriService Nursing Research Program on which she was a co-investigator. Doctor Sylvia examined and compared the prenatal care of uniformed women within the continental United States (CONUS) versus care provided Outside CONUS (OCONUS). Using both qualitative and quantitative approaches, she examined prenatal care from the perspective of both the recipient and the provider. Doctor Sylvia participated in the 16th Annual Karen A. Rieder Nursing Research Poster Session at the AMSUS 2004 Conference held in Denver, Colorada. Major General Barbara Brannon, Assistant Surgeon, Nursing Services, Office of the Surgeon General of the Air Force, noted that Doctor Sylvia's poster, *Prenatal Care - Perceptions of Military Women versus Their Health Care Provider*, was reviewed with the Federal Nursing sector and MG Brannon stated:

> ***As our health care environment increases in complexity, it becomes even more essential that we expand our body of unique scientific knowledge to optimize nursing outcomes. Your contributions in research and investigation are taking us in the right direction. Thank you for your great example and your enthusiasm for finding answers to today's questions. I hope it will be a model for others to follow***.

In addition, Doctor Sylvia completed a research project as a co-investigator on a project funded by the TriService Nursing Research Program to compare the effects of two methods of diabetes care on glycemic control. She has published two recent research articles: *Prenatal Care-Needs, Availability, Accessibility, Use and Satisfaction: A comparison of Military Women Within and Outside of the Continental United States*, in Military Medicine; and, *Exploration of Facilitators and Barriers to Prenatal Care Among Military Women* in Nurse Practitioner Forum.

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Colonel Linda J. Wanzer, AN, USA, MSN, CNOR, Assistant Professor, and Director, Perioperative Clinical Nurse Specialist Track, joined the GSN faculty in September of 2002. Prior to her arrival, COL Wanzer served as the Chief of the Operating Room and Central Material Supply for the Landstuhl Regional Medical Center. While serving in Europe, COL Wanzer stepped into the role of Perioperative Consultant for Readiness Issues in support of the 212th MASH contingency and training missions - certifying surgical readiness prior to the receipt of surgical patients to ensure that the standard of care was met throughout the field environment. Additionally, COL Wanzer has led the way in patient safety innovation and productivity at the unit, institution, and regional levels. ***Her efforts at the unit level spearheaded institution and region-wide standardization efforts focused on the creation of a non-punitive environment for reporting medical errors and the establishment of a process for improving "systems/ processes."*** Numerous perioperative risk aversion/patient safety initiatives instituted by COL Wanzer were highlighted in the book written by Jean Reeder - Patient Safety: A Perioperative Competency Module; her work was also published as a guide on the Association of Operating Room Nurses (AORN) web-page. Since 2001, COL Wanzer has served as an advisor to the Army's Perioperative Consultant to the Surgeon General. She has blended theory with practice in her review of new initiatives from MEDCOM, as well as using metrics formulation related to access-to-care standards and patient safety metrics for the perioperative field. ***COL Wanzer was selected to be a member of the AORN Presidential Commission for Patient Safety,***

serving since 2002. As such, she interfaces with the entire perioperative community inclusive of the American College of Surgeons and the American Nursing Association to develop and standardize patient safety initiatives. During 2003, COL Wanzer was invited by the TriService Nursing Research Program to participate in a "Grant Camp" to develop a grant examining critical issues encountered in the operating room environment. ***COL Wanzer spearheaded relevant student research for the Perioperative Clinical Nurse Specialty (CNS) Program that is relevant to the Military and Federal Health Care Systems and impacts practice within the perioperative scope of service.*** Students in the Perioperative Clinical Nurse Specialty (CNS) Program conducted a patient safety project in collaboration with United States Pharmacopeia (USP) entitled, *Analysis of Perioperative Medication Errors (A 5-Year Summary of Data Submitted to MEDMAX)*. This study was the first of its kind to look at medication errors throughout the perioperative continuum of care. This collaborative project between USU and USP provided an opportunity to impact practice, education, and research that should ultimately improve the quality and safety of perioperative patient care. This study is one example of the progress made, during 2004, in focusing GSN research towards relevant and substantive issues to the Military and Federal Health Care Systems, highlighted by the GSN Signature Curriculum.

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CAPT Sandra C. Garmon Bibb, USN (Ret.), DNSc, RN, Associate Professor, retired from the United States Navy in June of 2004, following 30 years of active duty service. Doctor Bibb currently serves as a faculty member in the newly established GSN Doctoral Program, research faculty for the Family Nurse Practitioner option (GSN MSN Program), and the Research Director for the Perioperative Clinical Nurse Specialist option (GSN MSN Program). Doctor Bibb is also the Chair of the GSN Research and Evaluation Committee; and, she serves as an alternate member of the National Naval Medical Center Institutional Review Board. ***Her expertise is in the area of population-based health care with emphasis on health promotion, disease prevention, health care disparity, and secondary analysis of existing population-based data sets.*** After completing an MSN with emphasis on health promotion, disease prevention, and family health, in 1991, Doctor Bibb was stationed in Gaeta, Italy, where ***she helped design and implement a comprehensive health maintenance program for over 800 military health care beneficiaries.*** She returned to the United States in 1993, and before attending the University of San Diego as a Full-Time Duty Under Instruction Student in the United States Navy (January 1997 - May 1999), ***she was the Coordinator of Health Promotion for Region Nine TRICARE, in San Diego, California. In this role, she used existing population data to complete the first-ever epidemiological assessment (population health profile) of over 200,000 health care beneficiaries within Region Nine TRICARE***. In addition, in this role, Doctor Bibb and two other team members were assigned to use approximately two million dollars of Congressionally-awarded Breast Cancer Education, Prevention, and Treatment funds to implement Region Nine's Breast Cancer Initiative. For her dissertation work, Doctor Bibb combined her interest in exploring aspects of access to care and the influence of cultural beliefs and values on health promotion behaviors and disease prevention practices with her interest in the breast cancer morbidity and mortality disparity between African American and Caucasian women within the Department of Defense; she conducted a population-based study describing the *Relationship Between Access and Stage at Diagnosis of Breast Cancer in African American and Caucasian Women in the Military Health System*. Findings from this study were published in the August 2000 issue of Military Medicine and the May 2001 issue of Oncology Nursing Forum. In June of 1999, ***Doctor Bibb reported to Naval Hospital Camp Pendleton (NHCP) and assumed the role of Command Research Coordinator. It was in this role that she planned and conducted a comprehensive Population Based Needs Assessment that resulted in the establishment of a Population Health Department at NHCP, the first-ever in the Navy***. An essay detailing the *Needs Assessment Process* was published in the April 2001 issue of Military Medicine. ***Doctor Bibb was invited to establish and head***

the new NHCP department and led a team of multi-disciplinary health care professionals in conducting numerous population-based studies. Doctor Bibb justified funding to support personnel and data warehouse resources necessary to sustain a comprehensive population health improvement initiative for over 70,00 beneficiaries. In April of 2002, she was invited to conceptualize and establish a joint Naval Hospital Camp Pendleton-Naval Medical Center San Diego Population Health Office due to her success with population health and outcomes at NHCP. In July of 2002, *Healthy People 2000 and Population Health Improvement in the DoD MHS* was published in Military Medicine. Doctor Bibb is recognized as a subject matter expert in Population Health and has had numerous podium and poster presentations related to population health. ***She was the co-author of the population health curriculum for the Navy's original Clinic Management Course and was part of the United States Navy Bureau of Medicine and Surgery (BUMED) Population Health Improvement Training Team from 2000 through 2004.*** Doctor Bibb has received numerous professional achievement awards. In 1996, she received the ***Outstanding Military Woman of Achievement Award*** from the San Diego County Women's Council Navy League. In 2000, she was a ***Minority Access, Inc Alumna National Role Model Citation Recipient*** and the ***Mary Nielubowicz Award Winner*** for the essay, *Population Based Needs Assessment in the Design of Patient and Family Education Programs*. In 2003, she received the prestigious ***Hughes Career Achievement Award for the School of Nursing and Health Science*** from the University of San Diego; and, in April of 2004, Doctor Bibb received the ***Legion of Merit*** for her contributions to the Navy during her tour of duty at NHCP from June 1999 through April of 2004.

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GSN GRADUATE PROGRAMS.

As of the Summer of 2004, the GSN offers two Graduate Programs at the Master and Doctoral Degree levels. The Master of Science Degree in Nursing Program has three areas of focus: Family Nurse Practitioner; Nurse Anesthesia; and, Perioperative Clinical Nurse Specialist. The Doctor of Philosophy in Nursing Program prepares nurses in research, education, and leadership as required by the Military Health System, the United States Public Health Service, and other Federal Health Systems.

MSN Degree Program - Family Nurse Practitioner.

Background. The first formal training program to prepare advanced practice (pediatric) nurses was established in 1960. In 1967, public health nurses received advanced training to care for patients in their homes. Nurse practitioners were initially taught to take a full medical history, conduct a comprehensive physical examination, and oversee the use of medications. Eventually, nurse practitioners were performing those activities in the offices of the physicians with whom they worked.

In 1977, the Medicare statute was amended to allow nurse practitioners to provide primary care independently in underserved rural areas. Nurse practitioner programs grew quickly; and, advanced practice nurses found work in hospital-based clinics, providing care to underserved patients. In 1994, the National Advisory Council on Nurse Education and Practice for the Health Resources & Services Administration of the Department of Health and Human Services identified the need to upgrade the knowledge, skills, and abilities of the existing registered nurse work force to match the practice requirements within today's health care systems. Currently, every state gives nurse practitioners some level of pharmaceutical prescribing authority.

In 1995, the Institute of Medicine engaged in an inclusive study, *Primary Care: America's Health in a New Era*. The study provided the following definition: primary care is the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community. Today, through advanced education and training in the science of disease prevention, health promotion, health education, and community and home-based care, the advanced nurse practitioner is recognized as an essential member of the health care team.

The American Association of Colleges of Nursing continues to report that the demand for advanced practice nurses is increasing. Current demands across the country are for advanced practice nurses who can deliver a high complexity of care across the projected life-span of their patients within an integrated health care system. The current shortage of advanced practice nurses who are qualified to assess, diagnose, and manage patients in primary care settings has also been confirmed. In light of this, the nursing community is dedicated to ensuring that the existing nurse practitioner programs are of the highest quality and that they meet or exceed all educational standards and credentialing safeguards established by the National Organization of Nurse Practitioner Faculties and the credentialing entities of the National League for Nursing.

Program Assessment.

Operational readiness and deployment are integrated throughout the *Advanced Principles of Adult Primary Care Course*. The course is designed to teach the student to develop a problem-solving grid for a variety of health problems. The focus is on selected minor acute and chronic diseases seen in primary care. Healthcare considerations unique to the field environment are addressed when discussing content related to that body system. Students are required to present a 50-minute presentation on an assigned topic including discussion of operational readiness issues. *The Adult Primary Care Course* practicum places students in military clinical settings. Operational readiness issues are interspersed throughout the practicum through exposure to patient experiences and preceptor feedback. Examples of these content areas include training in: dermatology specific to the operational environment, including skin lesions due to chemical and biological agents, trench foot, rashes from extended wear of uniforms, and conditions due to contact with foreign soil; insect and animal bites in the operational environment; common orthopedic injuries in the field environment and nontraditional treatment options; psychiatry including battlefield fatigue, combat stress, and posttraumatic stress disorder; head, eyes, ears, nose and throat conditions such as corneal abrasions in the field environment and hearing loss and protection; gastrointestinal infections more common in field environments, their prevention and the dietary impacts of change and stress; and, upper respiratory infections seen abroad.

Operational readiness components are woven into many parts of the *Advanced Principles in Primary Care of Women Course*. Students are given a CD which provides a comprehensive overview of the health care of women in military settings. All of the lectures emphasize healthcare issues salient to military women. Students are required to present a 35-minute presentation which includes issues relevant to operational women's health. The practicum component of the course places students in military clinical settings where they have the opportunity to practice what they have learned. Military specific content covers: preconception counseling of military women; contraceptive issues related to deployment and field hygiene; and, brightfield microscopy, including a handout and helpful tips on microscope handling and how to make portable field responsive kits for wet smears and gram staining.

***The Integration and Application of Family Theory in Primary Care Course* integrates concepts of family theory with an emphasis on military families and their assessment. Operational readiness topics include family stress and coping, support systems, long distance relationships, and readjustment after deployment. Guest speakers, who are often soldiers who have been deployed, discuss programs available to family members such as the Exceptional Family Member Program, Family Advocacy Program, and Drug and Alcohol Program.**

Second year GSN FNP students have two practicum experiences, one in the Fall and one in the Spring. Each student is responsible for completing the minimum of 240 clinical hours each semester. The majority of this clinical time is completed in a military facility. Thus operational readiness issues are integrated into their clinical experiences.

- **USU Board of Regents,** Report to the Secretary of Defense, *Operational Readiness Curriculum Specific to the FNP Program*, June 22, 2005, pages 13-14.

The GSN curriculum is guided by the USU and GSN mission statements and by *The Essentials of Master's Education for Advanced Practice Nursing* (American Association of Colleges of Nursing (AACN), 1996). Nineteen GSN terminal objectives are encompassed under six headings, applicable to both nurse anesthesia and nurse practitioner practice. The AACN *Essentials* document has identified core content areas for all Master Degree Programs as well as three additional areas specific to Master Degree Programs for advanced practice, direct-client clinical care. Because of the unique practice requirements for USU graduates as uniformed officers, the GSN faculty has included an additional terminal objective heading, "Readiness," which is not included in the AACN *Essentials* document. *The Essentials of Master's Education for Advanced Practice Nursing* articulates well with the *Domains and Competencies of Nurse Practitioner Practice*, as outlined by the National Organization of Nurse Practitioner Faculties (NONPF, 2000). The practice of the nurse practitioner is also reflected in a nationally accepted measure of quality of practice that is found in the NONPF, *Domains and Competencies of Nurse Practitioner Practice*. The GSN nurse practitioner curriculum is designed to prepare graduates to practice according to those specialty standards. Graduates from the GSN Master of Science in Nursing Program options of: Family Nurse Practitioner; Post-Master Family Nurse Practitioner; and, Post-Master VA/DoD Adult Nurse Practitioner are able to sit for all applicable nurse practitioner national certification examinations.

Family Nurse Practitioner - GSN MSN Program Option - One of the Nation's Best. The Family Nurse Practitioner (FNP) option within the GSN MSN Program has had ten graduating classes from 1995 through April of 2005, with a total of 110 graduates, which includes the 7 nurses who earned their MSN Degrees through the GSN Distance Learning Program. The GSN FNP Program is one of the strongest programs in the country, as evidenced by the certification examination pass rate of its graduates. Over 98 percent of the GSN FNP graduates have consistently passed the AACN National Certification Examination on their first attempt, as compared to the national average of a 70 percent pass rate on the first attempt. The FNP Program now has more than 90 clinical practice sites. The FNP Program option is 24 months in length, and with the addition of the six-credit Military Contingency Medicine Course, now totals 65 academic credits with over 900 hours of clinical experiences. (*In June of 1999, FNP was increased from 21 to 24 months to allow for the integration of women's health competencies as recommended by the Federal Nursing Chiefs; initially, FNP was 21 months in length and included 720 hours of clinical experience*.) There are currently 9 students in the Family Nurse Practitioner Class of 2005, and 17 students in the Class of 2006. Of these 26 students, 15 student officers are from the Army; 3 students are from the Navy; and, 8 students represent the United States Air Force. FNP alumni continue to provide care in operational environments such as those found in Iraq and Kuwait; and, they care for injured and displaced persons in humanitarian settings and provide health care in challenging local settings (i.e., Federal penitentiaries). The FNP curriculum prepares the graduates to meet all of these challenges with confidence and competence.

The GSN FNP Graduates are able to: assess, design and implement an appropriate plan for individualized patient and family care; collaborate within multi-disciplinary Federal health care environments; design and provide appropriate patient education; integrate research findings into clinical practice; utilize safe practices and ethical perspectives in their clinical practice; and, readily adapt to the changes and demands of individual and environmental health care.

Scholarly Project. Each student must complete an individual or group thesis or scholarly project before graduation from the FNP Program. The student's research project generally has application to the practice of the nurse practitioner and includes both quantitative and qualitative research, surveys, and clinical studies. All topics must be relevant to the Uniformed Services and serve to enhance the clinical practice of the graduate; a GSN research committee ensures that each scholarly project meets the USU

requirements for a Master of Science Degree. All students are encouraged to publish their findings. During 2004, students were involved in a variety of scholarly projects; and, they were encouraged to publish in peer-reviewed journals or to give poster and oral presentations of their findings. An emphasis is placed on outcomes and how they may be incorporated into future practice.

Family Nurse Practitioner - Student Research Projects:

Student	**Title of Scholarly Project**
CPT Cornali	*Hypertension, Hyperlipidemia, and Diabetes Rates in Military Women*
CPT Crouch	*Health Promotion in Reserve Component Women*
CPT Gainok	*Extended Oral Contraceptive Therapy*
CPT Glidewell	*Mass Casualty and Disaster Preparedness Training (DPT) in the DiLorenzo TRICARE Health Clinic at the Pentagon*
CPT Mullen	*Diabetes Self-Management Abstract for PHS 398*
CPT Reilly	*Ethical Dilemmas Identified by Department of the Army Nurses During Deployments*
CPT Riordan	*Extended Oral Contraceptive Therapy*

Simulated Patient Experiences. In addition to traditional classroom and clinical activities, FNP has partnered with the National Capital Medical Simulation Center (SIMCEN) to integrate objective simulated clinical examinations into all major courses. These simulations have proven extremely beneficial on two fronts: they facilitate faculty evaluation of each student's mastery of critical clinical skills; and, they permit each student to develop and enhance necessary clinical skills in a non-threatening environment. The use of simulated patient experiences begins during the students' initial Health Assessment Course. In this course, students review foundational assessment skills, such as history-taking and the physical examination of all major body systems. Following didactic anatomy lectures and corresponding cadaver laboratories, students receive in-class instruction on the assessment of each of the body systems. They then proceed to the SIMCEN where they practice their assessments in collaboration with specially trained patient-actors (simulated patients). During these experiences, faculty and peers use one-way mirrors and telemonitors to evaluate each student's performance. After each encounter, peers and faculty provide a critique resulting in immediate and valuable feedback. SIMCEN experiences are also videotaped so that students and faculty can review them and receive additional instruction and guidance. Over the course of the 24 months, students are exposed to additional simulation experiences in the form of Objective Simulated Clinical Evaluations (OSCEs) in their Adult Health, Pediatric, Women's Health and Practicum Courses. Over time, scenarios become increasingly more complex.

Clinical Sites at Military Treatment Facilities. Since its establishment, FNP has completed memoranda of understanding with 17 military treatment facilities: **(Army - 6)** DeWitt Army Community

Hospital, Fort Belvoir, Virginia; Kimbrough Ambulatory Care Center, Fort Meade, Maryland; Walter Reed Army Medical Center, Washington, D.C.; Fort Carson Army Community Hospital, Fort Carson, Colorado; Womack Army Medical Center, Fort Bragg, North Carolina; Darnell Army Community Hospital, Fort Hood, Texas; **(Navy - 6)** Annapolis Naval Medical Clinic, Annapolis, Maryland; National Naval Medical Center, Bethesda, Maryland; Quantico Naval Medical Clinic, Quantico, Virginia; Naval Ambulatory Care Center, Groton, Connecticut; Portsmouth Naval Medical Center, Portsmouth, Virginia; Pensacola Naval Hospital, Pensacola, Florida; **(Air Force - 5)** Malcolm Grow Medical Center, Andrews Air Force Base, Maryland; 1st Medical Group, Langley Air Force Base, Virginia; 60th Medical Group, Travis Air Force Base, California; 10th Medical Group, Air Force Academy, Colorado Spring, Colorado; and, the 375th Medical Group, Scott Air Force Base, Illinois. Additionally, FNP has affiliations with 90 non-DoD, Federal and civilian treatment facilities. These facilities provide the backbone for the nurse practitioner student's clinical experiences.

Faculty Activities. FNP faculty maintain certification and clinical acumen by working one day each week in a clinical setting. By maintaining a clinical practice, FNP faculty remain current, expand their clinical skills and frequently have the opportunity to observe and mentor students. These faculty are also active within the GSN, the University, and their local communities. FNP faculty perform a myriad of services to outside agencies by serving: on church advisory boards; in parent-teacher associations and Girl Scout Troops; as guest lecturers at local universities; and, as teachers of Lamaze Classes. In addition to their community service, FNP faculty maintain membership in many professional organizations, including the American College of Nurse Practitioners, the Commission on Collegiate Nursing Education (Site Evaluator), the Nurse Practitioner Association of Maryland, several State Bar Associations, the North American Menopause Society, the National Organization of Nurse Practitioners Faculties, and the Sigma Theta Tau Honor Society. During 2004, Ms. Diane Padden finished the didactic portion of her Ph.D. program; she is expected to complete all requirements for her Doctoral Degree during 2005. Ms. Padden, currently, is the final GSN civilian faculty member enrolled in a doctoral program; all others have their doctoral degrees.

In 2005, the Family Nurse Practitioner Program will have 17 students in the second-year class, with 21 students projected to arrive in June of 2005. This will be the largest FNP class since the program began in 1993. **Lieutenant Colonel Reyn Mosier, MSN, CRNP, USA, Assistant Professor,** took over as the new Program Director for the FNP Program in July of 2004, when Doctor Diane Siebert, transitioned to become the Acting Chair for the Department of Health Systems, Risk, and Contingency Management (DHSRCM). In 2005, the GSN and the FNP Program will bid farewell to two faculty members; and, they will welcome two new faculty into the FNP family. **LTC Reyn Mosier, USA,** and **Colonel Sarah Wrenn, USAF, Ph.D., CRNP, Assistant Professor,** will be departing after three years at USU; they have been highly productive and dedicated members of the program and will be sorely missed. Their replacements are both USU/GSN alumni selected from a highly competitive field of candidates. **Major Sandy McNaughton, USA,** and **Lieutenant Colonel Michele Levey, USAF,** will be joining the GSN as faculty members next Spring.

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MSN Degree Program - Nurse Anesthesia.

Background. Nurse anesthetists have faithfully served their Nation during all of its wars and conflicts and during times of peace throughout the 20th Century. During the late 1800's, Doctor Charles Mayo appointed Alice Magaw, his nurse anesthetist at St. Mary's Hospital in Rochester, Minnesota, as the *Mother of Anesthesia*. She was a talented anesthetist at a time when people from all over the world came to the Mayo Treatment Center to learn from its physicians and nurses about anesthesia. In fact, the United States Army sent nurses to Doctor Mayo to study anesthesia before the Nation entered World War I.

Nurse Anesthetists provided anesthesia during World War I and served in Combat Clearing Stations near the front lines in France; they taught French nurses and physicians to do anesthesia, and with the concurrence of British physicians, taught British nurses to provide anesthesia; thereby, relieving over 100 physicians to do other medical and surgical work. During World War II, four nurse anesthetists were among the nurses captured in the Philippines, having provided anesthesia services in the jungles of Bataan and on Corregidor until the ether, other drugs, food, and ammunition ran out. Nurse Anesthetists served with distinction throughout every operational theater in WWII; they were at Anzio, Salerno, on board Navy ships, and went into Normandy with the first hospital.

Nurse anesthetists also served proudly during the Korean War, in Vietnam, Granada, Panama, Somalia, Desert Storm, Enduring Freedom, and other military missions requiring anesthesia capability. Throughout the past Century, physicians and nurse anesthetists have successfully worked together during times of war, humanitarian operations, and in civilian practice.

Nurse Anesthetists, among the first to incorporate the Harvard Monitoring Standards, consistently follow the philosophy that the nurse anesthetist has a duty to the patient he/she anesthetizes, to stay with the patient and to provide continuous care and monitoring. While most professional certifications for nurses were started in the 1970's, the Nurse Anesthesia Certification Program has existed since 1945. Specialty nursing certification has grown significantly over the last two decades. A study conducted by the Nursing Credentialing Research Coalition and released in February of 2000, found that certification has a dramatic impact on the personal, professional, and practice outcomes of certified nurses. Specifically, the study stated that certification is a successful approach to improving patient safety and the overall quality of care. In addition, the practice of anesthesia is much safer today due to advancing knowledge and technology, which allows every one in the operating room, from the surgeon to the nurse anesthetist, to the technician, to perform his, or her, job more efficiently.

Program Assessment.

The Basic Principles of Nurse Anesthesia Course **includes content on all field anesthesia equipment deployed in the operational setting and on the care and treatment of neurological and chemical casualties. Students are also taught to calculate gas inhalation concentrations, a unique need in the deployment setting where gas analysis is frequently unavailable.**

The Advanced Principles of Nurse Anesthesia Course **includes content on regional anesthesia and combat trauma.**

Chemotherapeutics for Nurse Anesthetists **includes lectures on acute and chronic pain management and therapeutic interventions that would be appropriate in the operational setting.**

- **USU Board of Regents,** Report to the Secretary of Defense, *Operational Readiness Curriculum Specific to the Nurse Anesthesia Program*, June 22, 2005, page 13.

The Competency Outcomes of the Nurse Anesthesia option in the MSN Degree Program are consistent with the missions of the USU and the GSN and with the *Essentials of Master's Education for Advanced Practice Nursing*, as accepted by the American Association of Colleges of Nursing (AACN, 1996). Additionally, the Nurse Anesthesia Competency Outcomes are in accordance with the American Association of Nurse Anesthetists' (AANA, 1996) *Standards of Nurse Anesthesia Practice*. The GSN graduates of Nurse Anesthesia are able to perform the following: a thorough pre-anesthetic assessment; obtain informed consent; formulate and implement a patient-specific plan for anesthesia care; collaborate with other members of the health care team; and, transfer the responsibility for care.

The GSN Nurse Anesthesia option, within the MSN Degree Program, has had nine graduating classes from 1996 through April of 2005, for a total of 121 graduates. Forty-four students are currently enrolled; Nurse Anesthesia is 30 months long with 53 academic credits. Nurse Anesthesia students average 65 clock hours at clinical sites each week; and, they complete 940 anesthetic cases during their program of study. In December of 2004, 17 students graduated from Nurse Anesthesia. All have passed the National Certification Examination for nurse anesthetists and are credentialed to practice in their respective Services. ***An astounding 12 of these 17 graduates attained the maximum score on the National Certification Examination in 2004!*** The Nurse Anesthesia Class of 2005 has 20 students; and, the incoming Class of 2006 has 24 students. Of those 44 students, six students are Army officers; five are Navy officers; 32 student officers are from the Air Force; and, one student officer represents the Public Health Service.

Upon completion of the Nurse Anesthesia option, the Nurse Anesthesia faculty are committed that, either through the oral examination process or actual demonstration on any patient or selected pieces of equipment, the nurse anesthesia graduate will have the ability to: comply with USU GSN requirements for graduation; meet, or exceed, Council on Certification of Nurse Anesthetists Case Requirements; satisfy eligibility requirements to write the Certification Examination; obtain the academic capability to pass the Certification Examination; successfully master the Terminal Objectives; and, be able to meet the mission of Nurse Anesthesia at USU.

Clinical training was restructured within Nurse Anesthesia to ensure that all students are assigned to a military hospital as their primary clinical training site. A clinical coordinator is assigned at each site whose primary responsibility is to oversee student scheduling and to evaluate their progress; this oversight responsibility has increased consistency in the evaluation and scheduling of the rotations. In addition, the site coordinators participate in all faculty meetings, maintain student records, and complete other administrative activities associated with running the clinical training.

Scholarly Project. Each graduate must complete an individual or group thesis or scholarly project before graduating from the GSN. The student's research project generally has application to anesthesia practice and includes bench studies, both quantitative and qualitative research, surveys, and clinical studies. All topics must be relevant to the Uniformed Services and serve to enhance the clinical practice

of the graduate. Students are encouraged to publish in peer-reviewed journals or to give poster and oral presentations on their findings. During 2004, students were involved in a variety of scholarly projects, including both clinical and bench research studies; and, increased emphasis was being placed on conducting quantitative studies.

In the Spring of 2003, **Lieutenant Colonel Bruce Schoneboom, AN, USA, CRNA, Ph.D. (USU Neuroscience Graduate Education Program Class of 2000), Assistant Professor,** joined the Nurse Anesthesia Program as the Research Director. LTC Schoneboom increased the tracking of the scholarly projects; and, he made visits to each clinical site to ensure that all of the students completed their research projects. In addition, LTC Schoneboom established relationships with leading military and civilian experts in the areas of intravenous anesthesia and pain management, which increased the research opportunities for the Nurse Anesthesia students. In 2004, **LtCol Paul Austin, USAF,** replaced LTC Schoneboom as the Nurse Anesthesia Research Director upon LTC Schoneboom's appointment as the new Director of the Nurse Anesthesia Program. Nurse Anesthesia students returning to campus prior to entering the last six months of their clinical rotations are encouraged to submit posters for presentation; and, students are required to present an oral defense of their research to meet the course requirements.

Nurse Anesthesia - Student Research Projects:

Student(s)	**Title of Scholarly Project**
Capt(s) Stevenson & Scholes	*Readiness Estimate and Deployability Index for AF Nurse Anesthetists*
LT(s) Leeds & Swift	*Laboratory Evaluation of Three Field Anesthesia Machine Ventilators*
Capt(s) Bland & Perkins	*History of Nurse Anesthesia in the Air Force*
Capt(s) Barberio & Bolt	*Pollution of Ambient Air by Volatile Anesthetics: Comparison of Four Management Techniques*
Capt(s) Acrosta & Aponte	*Use of Ultrasound in Placement of Intravenous Catheters*
Capt(s) Skinner, Gilmer, Molloy & Wells	*Imposed Work of Breathing of Airway Adjuncts*
LT(s) Volk & Rhodes, & LCDR Ryan Nations	*Effects of Fatigue on the Performance of Anesthesia Providers in a Simulator Setting*

Simulated Patient Experiences. The use of a patient simulator and the instructions for using regional anesthesia and central line placement have been incorporated, wherever possible, into the Nurse Anesthesia curriculum. This has resulted in providing a bridge between the academic and clinical phases of the educational experience. Today, the use of the SIMCEN has been expanded to incorporate: 1) the use of standardized patients in the Health Assessment Course; 2) the use of simulator bronchoscopic stations in teaching airway management; and, 3) the use of the human patient simulator for teaching Basic and

Advanced Principles of Anesthesia and Anesthesia Pharmacology. Other resources have allowed the use of virtual reality in teaching the Anatomy Courses; and, research studies are being conducted by the students and faculty to determine the quality of education utilizing virtual reality and the desirability for its use in the future. A faculty member of Nurse Anesthesia, in collaboration with faculty at Harvard University, worked on the use of the Anesthesia Simulator; and, a second laboratory section of the Patient Simulator Laboratory was instituted in conjunction with the Advanced Principles Course, which allows an increase of individualized instruction through the use of this state-of-the-art simulator.

Clinical Sites at Military Treatment Facilities. Nurse Anesthesia has four primary military clinical training sites: 1) the Air Force Medical Center at Wright Patterson Air Force Base, Ohio; 2) the Walter Reed Army Medical Center/National Naval Medical Center (a joint site as is the Anesthesiology Program) in Washington, D.C.; 3) the Naval Medical Center at San Diego, California; and, 4) the Air Force Medical Center at Keesler Air Force Base, Mississippi. Nurse Anesthesia students also rotate to 21 Federal, civilian, and non-DoD health centers to obtain additional experience and complete required cases. A full review of all primary and non-primary clinical sites was completed during 2003 as part of the recently successful re-accreditation process. In June of 2004, the Navy Nurse Anesthesia students also began using the Naval Hospital Jacksonville as a clinical site.

Faculty Activities. Continuous changes have occurred over the past year to enhance Nurse Anesthesia at the GSN. Communication has been enhanced by the creation of web-based bulletin boards, which allows for seamless communication between the students, faculty, and staff. In addition, password-protected educational materials are also posted, which allow the students to access a variety of material from any Internet-capable computer. The research component of the program is evolving from a thesis-based product to one more easily disseminated to the CRNA community. Increased emphasis is being placed on conducting quantitative studies and on presenting results through poster and oral presentations and publishing in professional journals.

While Nurse Anesthesia graduates do well on their National Certification Examinations, there are areas identified for enhancement. Two anesthesia simulators have been successfully integrated into the Principles of Anesthesia Courses. Both of the simulators, located in the USU School of Medicine Department of Anesthesiology and at the SIMCEN, are used many times per week to enhance student learning; and, changes in the curriculum, specifically regarding Pharmacology, were integrated during the Fall 2002 Semester. Computerized testing is being developed and will provide an inclusive review of the required material for students in their clinical phase. Other testing venues, such as oral boards, are also being developed. The Student Evaluation Examination (SEE) is being purchased for all students for use at two separate times during their training for assistance in determining future areas of concentration and study. Numerous testing strategies have been incorporated by the faculty into both the clinical and didactic phases of Nurse Anesthesia. In appropriate courses, examination questions were converted to a format similar to that found in the National Certification Examination; and, an Internet-based testing system has been adopted. Although the new testing system does not have the capabilities of a computer-adaptive examination, it is formatted similar to that found in the National Certification Examination. For example, once a question is answered and submitted, the student may not return to it to change the answer. Test statistics and examination grades are provided immediately upon the completion of each examination.

The Nurse Anesthesia Faculty Steering Team meets twice a year and reviews all courses, course evaluations, and course content. Changes have been recommended to further integrate the basic sciences, primarily Pharmacology, with the Principles of Nurse Anesthesia. Anesthesia Pharmacology will now

be introduced during the second semester, vice the third; this will allow more depth of knowledge to be presented in the Basic Principles of Anesthesia Course. The Medical Pharmacology Course, taken with the medical students, has been modified and feedback from members of the Class of 2004 indicates that the modifications, which increased the number of topics more specific to the practice of anesthesia, were beneficial.

A new educational experience for senior students has also been developed. In the Spring(s) of 2003 and 2004, the graduating Nurse Anesthesia Classes returned to the University for a series of seminars and workshops. Classes on regional anesthesia were conducted on cadavers in the USU Anatomical Laboratory. Advanced techniques were presented; and, students discussed difficult or significant cases that they had encountered at the clinical sites. An advanced airway workshop was presented; various adjunct equipment used for the management of the difficult airway was made available for practice on the patient simulator and other mannequins, to include the fiberoptic, Bullard laryngoscope, retrograde intubation, tube changers, the Combitube, and the Fastrach/LMA. Another laboratory allowed students to practice emergency surgical airways such as jet ventilation, cricothyrotomies and tracheostomies.

Crisis management was practiced and tested on the patient simulator. Students were given a series of scenarios to study prior to the testing period such as bronchospasm, MH, total spinal, and anaphylaxis. Students were then brought into the simulation area to experience a realistic scenario; immediate feedback was given to each student upon completion of the exercise.

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MSN Degree Program - The Clinical Nurse Specialist.

Background. In June of 2001, a need for a Clinical Nurse Specialist (CNS) option in the GSN MSN Degree Program was identified by the Federal Nursing Chiefs; and, the groundwork was completed to begin the development of the first Clinical Nurse Specialist option with a focus on Perioperative Nursing. A feasibility study and development of a pilot program were completed and presented to the Federal Nursing Chiefs. In January of 2002, Founding Dean Abdellah and the GSN Associate Dean presented the CNS option to the USU Executive Committee, receiving subsequent approval from the Surgeons General of the Army, Navy and Air Force. The CNS option was then approved by the USU Board of Regents during its meeting held on February 27, 2002. In the Spring of 2002, a selection process was initiated to identify the Clinical Nurse Specialist Director and supporting faculty from within the three Uniformed Services. Program development began in the Fall of 2002 with the arrival of the CNS Director. The program's curriculum and foundational structure were built around the American Academy for Colleges of Nursing publication on *Essentials of Masters Education for Advanced Practice Nursing*. The perioperative specialty content evolved from a comprehensive process of blending field research, program goals, and clinical expert interviews with the Federal Nursing Chiefs. Validation of the program's content/curriculum was accomplished through a process of merging program content with the published *Association of Operating Room Nurses Advanced Practice Competencies*. After minor adjustments were made, the "content map" was presented to key senior leaders within the perioperative community, uniformed and civilian, to ensure that the CNS content was congruent to support the new role in practice and within the Military Health and Federal Health Care Systems.

Program Assessment.

The *Standards Quality and Safety for CNS Perioperative Practice II Course* engages students in consultative/collaborative relationships with health care providers from several disciplines to focus on problem-solving activities within the practice environment. The link is made to contingency operations as students explore these relationships and address clinical issues such as malignant hyperthermia, advanced airway management, and trauma.

The *Leadership and Health Care Resource Management Course* integrates military operational venues within both traditional and contingency health care environments to challenge the Perioperative CNS with realistic fiscal and personnel resource allocation issues. Students formulate strategies for decision making while considering the impact those decisions have on operational performance. Contingency planning is one focus of this course. Students develop plans for the delivery of perioperative services during unplanned events such as natural disasters, influx of mass casualties, and significant loss of staff due to deployment.

The *Advanced Principles for Perioperative Management II Course* emphasizes the application of critical thinking skills in the analysis of facility design and renovation of perioperative settings. Throughout the design process, issues crucial to operational functions within this dynamic environment, in both fixed facilities and deployed settings, are emphasized. These include infection control, safety, work flow, efficiency, quality control, communications, climate control and force protection. Students also study standards with which they are expected to comply, such as the complex network of regulations from local, state, and Federal agencies and standards created by multiple professional organizations.

The *Clinical Practicum and Seminar for Perioperative CNS Practice I Course* has three main rotations. One focuses on the analysis of perioperative skill sets necessary to enrich the professional development of the perioperative nurse in trauma and/or contingency operations. During this rotation, students operationalize the knowledge and experience gained during *Military Contingency Medicine* and *Operation Bushmaster* (both are also required courses for the Perioperative CNS and FNP students) **to fully explore perioperative trauma competencies from a global perspective. The major thrust of the Clinical Practicum and Seminar for Perioperative CNS Practice II Course as it relates to operational readiness lies in instruction on the expanded role of the Perioperative CNS during operational missions. The surgical assistant activities in the operating room help the student gain clinical expertise on procedures similar to those in the deployed environment and didactic instruction in perianesthesia skills and the perianesthesia care unit.**

- **USU Board of Regents,** Report to the Secretary of Defense, *Operational Readiness Curriculum Specific to the Perioperative CNS Program*, June 22, 2005, pages 15-16.

Within this new program option, six new courses were developed and implemented in adherence with the guiding principles established by USU, GSN mission statements, *The Essentials of Master's Education for Advanced Practice Nursing* of the American Association of Colleges of Nursing (AACN, 1996), the National Association of Clinical Nurse Specialists (NACNS), and the Association of Operating Room Nursing Advanced Practice Competencies/Outcomes. To date, course outcomes and programmatic evaluations have met the outcome goals in preparing the CNS graduates to practice in accordance with specialty standards.

Clinical Nurse Specialist (CNS) - GSN MSN Program Option Focused on Perioperative Nursing - the ONLY Perioperative CNS Program in the Nation. The Perioperative Clinical Nurse Specialty (PCNS) option within the GSN MSN Program began with the Class of 2005 (entry date: June of 2003), with a combined total of eight students from the three Services (Army - 3; Navy - 2; and, Air Force - 3). The Class of 2006 (entry date: June of 2004) consisted of nine students representing the TriServices (Army - 2; Navy - 3; and, Air Force - 4). In support of establishing and maintaining a premier program, measures are taken to maximize the programmatic use of resources unique to the National Capital Region. Adjunct faculty have been identified throughout the Region/Nation, across Service lines, and within industry, to augment the on-site perioperative team in the expansion of the breadth and depth of both clinical and specialty-specific learning outcomes for the PCNS students.

Scholarly Project. Each PCNS student must complete an individual or group thesis or a scholarly project before graduating from the GSN. The student's choice of research projects is focused on topics relevant to the Uniformed Services; topics must be aligned with the GSN research focus; and, they must be targeted to enhance clinical practice within the specialty. All students are encouraged to publish in a peer-reviewed journal and/or to conduct poster and oral presentations on their findings. Students enrolled in the Perioperative CNS Program are currently conducting research within the following GSN Research Foci.

Patient Safety: Reducing the Risks for Surgical Populations.

- *Class of 2005*
    - Pilot study designed to collect/analyze data to profile common characteristics of the surgical population who may be at risk for untoward events related to body piercing(s).
    - Secondary analysis of medication error data conducted to identify the impact of organizational characteristics on the occurrence of medication errors across the perioperative continuum of care.
    - Identify/quantify the presence of microbial flora on telephones in the OR as a platform for future research to correlate microbial flora and nosocomial infections.
- *Class of 2006*
    - Pilot study designed to describe the effects of continuous, prolonged fluoroscopy on surgical patients.

Evidence-Based Practice.

- *Class of 2006*
    - Assessment of the completeness and accuracy of Federal Health System Clinical Databases used to foster evidence-based practice within the perioperative environment.

Leadership/Support.

- *Class of 2006*
    - Role identification for the Perioperative Clinical Nurse Specialist utilizing a systematic review of the literature.

Simulated Patient Experiences. The incorporation of simulated patient experiences as a learning activity for the PCNS students is utilized within several of the PCNS courses, beginning with the first nine-week summer semester: *Advanced Health Assessment: Clinical Correlates for Perioperative CNS*. This course provides a foundational program of instruction challenging students' critical thinking and clinical decision-making abilities, as applied to perioperative patients in the traditional and operational health care environment. Utilizing *Standardized Patients*, students are evaluated on interviewing skills, collaboration with interdisciplinary health care providers, and critical assessment knowledge in the development of perioperative care plans. With the assistance of *Standardized Patients*, this course provides a venue for students to effectively manage surgical patients and positively influence outcomes, which are vital roles of the advanced practice nurse. Additional learning opportunities utilizing simulation learning laboratories

are used to augment lectures with hands-on applications (i.e., airway laboratory and surgical experience during the Bushmaster field exercise).

Technological Support for Learning. Technologies are used to further enhance the learning environment through the development of on-line learning modules/activities (i.e., threaded discussions, activity postings with peer analysis, and modules with on-line skills tests).

Clinical Sites at Military Treatment Facilities. Currently, the PCNS Program is utilizing six primary clinical training sites located within the National Capital Region: 1) the Walter Reed Army Medical Center, Washington, D.C.; 2) the National Naval Medical Center, Bethesda, Maryland; 3) the Malcolm Grow Medical Center, Andrews Air Force Base, Maryland; 4) the Dewitt Community Hospital, Fort Belvoir, Virginia; 5) the National Institutes of Health (NIH), Bethesda, Maryland; and, 6) the Veterans Administration, Washington, D.C. There, in consultation with their clinical preceptors, the students receive focused, clinical experiences and complete projects within the five CNS domains. A clinical coordinator oversees student scheduling and is involved in the evaluation phase of the students' progress. In addition to the traditional clinical experiences within the medical treatment facilities, experiences with industry and associated military support sites are utilized (i.e., Region 1 TriService Standardization; Facilities Design - Office of the Surgeon General; the Joint Commission on Accreditation for Health Care Organizations; Manpower Regionalization; the Joint Readiness Clinical Advisory Board at Fort Detrick, Maryland; United States Pharmacopoeia; and, Kaiser Permanente in San Francisco, California).

Faculty Activities. During the development and implementation phase of the overall program, all aspects in support of student learning experiences were developed. Communication mechanisms for both the faculty and students were created in the form of a password-protected, web-based bulletin board, which serves as a *one-stop-shop* for student access to course syllabi, class outlines, and educational/lecture materials. A *Patient-Safety* resource site was also established, especially for the PCNS students and placed on the USU Learning Resource Center web site to facilitate specialty projects throughout the PCNS option.

Evaluation Structure. An evaluation structure for the PCNS option within the GSN MSN Program has been established, linking student evaluations with the course coordinator evaluations, which immediately follow the students' final examinations. This process provides an inclusive review of each course, with immediate feedback from the entire PCNS faculty; this orchestrates course changes and enhancement. During the review process, the course coordinator provides the Program Director with a CD complete with the course syllabus, class competency outcomes, learning activities, PowerPoint lectures, and handouts to be archived for future use.

Teaching Across Programs. Key to the success of the PCNS option is the *leveling of course content* to ensure consistency with the GSN terminal objectives. Dean Hinton Walker maximized the faculty resources of the GSN by *actualizing* the faculty in terms of course development, thus fostering an organizational climate supporting the theory of *teaching across programs*.

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The Doctor of Philosophy Program.

Background. To meet an evolving requirement for nursing research relevant to the MHS, the USPHS, and other Federal Health Systems, in March of 2002, with the approval of the Federal Nursing Chiefs, the GSN Founding Dean began the process for the development of a Doctoral Program in Nursing. The GSN Doctoral Program prepares nurses to be uniquely qualified as leaders in research, education, and clinical practice to serve in the MHS, USPHS, and other Federal Health Systems. In the context of concerns over patient safety, nursing research must be conducted to assess the linkages between nurse staffing, safety, and outcomes assessment throughout the TRICARE Management Activities. Additionally, with the well-recognized national shortage of both staff nurses and nursing faculty, GSN doctoral graduates are prepared to augment faculty requirements at educational organizations and to provide researchers for studying health care in the MHS, USPHS, and other Federal Health Systems. ***A doctoral program that has a focus on the MHS as well as the USPHS and other Federal Health Systems is not available at civilian universities; and, no other institution is better positioned than the USU GSN to provide a Doctoral Program with such a unique focus.***

Dean Hinton Walker presented the GSN Doctoral Program to the USU Board of Regents (BOR) and received formal approval for the establishment of the Doctoral Program at the BOR meeting of October 24, 2002. In addition, the GSN held inclusive focus sessions to determine both the interest and support for its proposed Doctoral Program, to include the initiation of steps for the enrollment of its Charter Class, during 2003. The Doctoral Program in Nursing is open to DoD nurses (active duty, reserve, and civilian) and to nurses from other Federal agencies who are nominated and supported by their Service or Agency. The new program accommodates both full-time and part-time students and incorporates aspects of both distance and alternative learning, as appropriate. The GSN welcomed its first doctoral students in the ***Fall of 2003***, bringing to realization the vision of the Founding Dean. ***Three students were admitted into the full-time program*** (Army - 2; Federal Health Agency - 1); they are expected to complete their degree requirements by 2006. Ten students (USPHS - 4; Veterans Affairs - 2; Reserves - 4) matriculated into the part-time option. Of the initial ten part-time students, eight remain and are expected to complete their degree requirements by 2008. (*NOTE: The GSN part-time doctoral students work at their assigned sites during the day and participate in the Doctoral Program after working hours.*)

The second cohort of doctoral students entered in the ***Fall of 2004***. ***Four full-time doctoral students were enrolled***: Air Force - 2; and, Navy - 2; they are expected to complete their degree requirements by 2007. Nine part-time doctoral students matriculated into the program: Army - 2; Health and Human Services - 2; USPHS -2; Veterans Affairs - 1; and, civilians - 2 (one is employed by DoD; the other is employed at the Walter Reed Army Medical Center); the part-time students are expected to complete their degree requirements by 2009.

The Doctoral Program in Nursing Science includes a common core of required courses and electives. The program consists of five areas of concentration: 1) *Nursing Knowledge*; 2) *Research Methods, Statistics, and Designs*; 3) *Cognate/Elective Courses*; 4) *MHS and Federal Health Care Policy and Issues*; and, 5) the *Dissertation*. The ***Nursing Knowledge Core Content*** consists of a sequence of courses focusing on the development and application of theory in nursing and related disciplines and ethical conduct in nursing practice and research. ***Research Methods, Statistics, and Designs Core Courses*** examine approaches in both qualitative and quantitative research. Advanced research methods core courses address relevant issues of the MHS, the USPHS and other Federal Health Systems via existing large data sets, while assisting graduates to develop continuing programs of research. ***Cognate/Elective Courses*** support and strengthen the selected research focus and/or process. ***MHS and Federal Health Care Nursing Policy***

and Issues Core Courses focus on MHS-specific and Federal health care issues, thus preparing graduates to conduct research and to assume leadership roles in this area of study. These four components culminate in the fifth component, the ***Dissertation***, which follows the successful completion of the qualifying and comprehensive examinations. A minimum of 96 semester hours is required to complete the program. The GSN doctoral program is comparable in structure to the existing USU School of Medicine Graduate Education Programs.

The curriculum has three focused research and practice areas. These include: 1) Population Health and Outcomes; 2) Operational Readiness in a Changing Environment; and, 3) Clinical Decision-Making in the MHS, the USPHS, and other Federal Health Care Systems. Strong cross-cutting emphasis is placed on patient safety, ethics, force protection, the impact of technology, and international health.

All doctoral students will participate in structured research assistantships to broaden and improve their research experience. Proposed practicum experiences include research-focused experiences in the National Capital Area at DoD, USPHS, or other Federal Agencies with uniformed nurse researchers or at civilian health care facilities. To address current and future nursing requirements, teaching assistantships will also be offered to prepare some GSN graduates as educators in response to the ever-increasing national shortage of doctorally-prepared faculty.

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MSN Degree Program - Post-Master Certificates.

The Post-Master FNP Certificate. The Post-Master (PM) Certificate was established in 1999, primarily in response to the Army Nurse Corps' decision to transition from a specialty nurse practitioner to a family nurse practitioner focus. As the transition progressed, the number of students in the PM option varied, with the GSN annually awarding certificates to between one and four FNPs between 1999 and 2003. To date, the USU GSN has awarded Post-Master FNP Certificates to 15 uniformed officers. The PM option varied in length from 9 to 12 months, depending on the student's prior education and experience; there were 31 academic credits with 562 hours of clinical experience. In August of 2002, two Post-Master students completed the PM option and four new students were enrolled. This group of students (the Class of 2003) was the last, as most of the Army's Specialty Nurse Practitioners have, by now, become FNPs, retired from the Army, or transitioned into a nursing administration or leadership role.

The Adult Nurse Practitioner Post-Master Certificate - The Department of Veterans Affairs/ Department of Defense Distance Learning Program.

This distance learning program has been particularly important for the San Juan VA since there are no Nurse Practitioner Programs in the local community, nor in the United States Virgin Islands.

This collaborative program between the Uniformed Services University of the Health Sciences and the Department of Veterans Affairs has been one of true excellence. It has produced a group of professionals, fully prepared through course work and clinical practice, to diagnose and manage primary care of adults. It is a living example of successful VA/DoD collaboration.

The support provided by the program faculty and staff has been extraordinary. The feedback to the participants has been timely and always helpful. The site visits were one of the program elements that helped participants and preceptors alike, to remain on course towards the goals of the program.

The graduates of this program have wisely used this opportunity to advance their careers and, ultimately, to be better prepared to provide the excellence in care that our veterans deserve...

As you prepare for your certification exams, do so with the confidence that you have been given the best preparation you could possibly have received and you have demonstrated that you have the commitment to continue achieving your goals.

- **Ms. Kathleen Collins, VA Medical Center, San Juan, Puerto Rico,** Remarks at the Department of Veterans Affairs/Department of Defense Distance Learning Nurse Practitioner Program Virtual Graduation Ceremony, May 13, 2003.

Background. The restructuring of the Department of Veterans Affairs (VA) Health Care System in the mid-1990's called for a 200 percent increase in the number of primary care providers throughout 155 VA Medical Centers. To achieve this goal, the VA determined that one effective solution would be to assist currently employed, Master Degree-prepared VA nurses to obtain new knowledge and skills as nurse practitioners. *Nearly 750 VA Master Degree-prepared clinical nurse specialists indicated interest in a post-degree, nurse practitioner certificate program if it were offered via distance education.* The USU Graduate School of Nursing (GSN) was selected by the VA to coordinate this effort. The USU GSN curriculum was unique and a national first because it was built on the excellent resources of the VA to implement well-defined, closely-monitored, clinical practica offered concurrently with didactic content provided by the fully-accredited USU GSN.

Responsibilities of the USU GSN. Under the direction of **Founding Dean Faye Glenn Abdellah, Ed.D., Sc.D., RN, FAAN**, the USU GSN agreed to: 1) determine the length of the program; 2) establish the curriculum; 3) allocate credit for the courses; 4) assure that graduates were qualified for certification; 5) develop policies for the transfer of credit for prior courses; 6) adjust and modify institutional policies to accommodate the VA civilian registered nurse students; 7) validate appropriate faculty from the VA and the GSN to instruct in the Distance Learning Program (each had to hold at least a Master Degree, preferably in Nursing, be prepared in a nurse practitioner specialty, and be currently certified); 8) provide support staff; and, 9) procure resources for the new post-master certificate. The classes were designed to parallel the on-campus GSN courses and would be held twice a week for two hours, with a third hour conducted as a laboratory activity by the lead preceptor at the individual VA sites.

Responsibilities of the VA. **Charlotte Beason, Ed.D., RN, CNAA, Director, VA Nursing Strategic Healthcare Group of the Office of Patient Care**, was the Project Coordinator with responsibility for ensuring that the VA would: 1) utilize its national telecommunication network for the Distance Learning Program; 2) obtain the distance learning sites at the VA Medical Centers; 3) select the students and submit candidates to the GSN for evaluation of academic requirements; 4) provide educational resources for the students such as library books and computers; 5) approve the assignment of VA employees to serve as on-site preceptors who would coordinate with the GSN in the Distance Learning Program; and, 6) provide the VA portion of the funding for the Project.

Responsibilities of the VA Medical Centers with Distance Learning Sites. The VA Medical Centers with distance learning sites agreed to provide the following: 1) an educational coordinator to administer the certificate program; and, 2) a Master Degree-prepared nurse practitioner preceptor to arrange and supervise the clinical aspects of the distance learning program.

During Late 1996, the GSN and the VA Nursing Strategic Healthcare Group Entered into a Working Partnership and Agreed to Conduct a Two-Phase Project. Phase I would consist of one course to test the feasibility of the project. Phase I, The Pilot Project Test Class, was initiated in early 1997. Following extensive evaluation, it was found that it successfully met the didactic and clinical requirements of both the GSN and the VA. Phase II contained the remainder of the curriculum study. Phase II, the twenty-month VA/DoD Distance Learning Program, was initiated in the Fall of 1997. Phase II included 35 students located at eight VA Medical Centers from California to New York; the certificate program was

conducted in conference rooms on the USU campus, which were fully equipped for teleconferencing. The curriculum developed by the GSN emphasized: 1) comprehensive physical and psycho-social assessment; 2) decision-making processes in both acute and chronic health conditions; and, 3) health maintenance care. The distance learning program consisted of nine courses that stressed both health promotion and disease prevention. There were 29 credits of didactic content and a minimum of 560 hours of clinical experience over five semesters or 20 months.

Technology Used in the Distance Learning Program. The VA/DoD Distance Learning Program is composed of didactic course work delivered via state-of-the-art distance learning technology, including interactive video teleconferencing and the Internet. The GSN extended its network of high-speed, digital telephone lines from USU's compressed-video classroom to the VA Telecommunication Center in Martinsburg, West Virginia (the Hub), which in turn, is linked to the various distance learning sites at the VA Medical Centers. During the twenty-month Distance Learning Program, the VA was in the process of upgrading its technological capacity. As a result, most of the VA Medical Centers were equipped with video teleconferencing capabilities. Several computer and educational technologies were immediately required to ensure the success of the project. Requirements included: an upgrade of the file server at the Hub in Martinsburg, West Virginia; the establishment of a video teleconferencing unit at USU; and, the confirmation of video conferencing capability at each site. All was accomplished.

The First Advanced-Level Virtual Graduation in the VA and the DoD. Twenty-six students graduated through a virtual commencement exercise from the VA/DoD Distance Learning Program on May 18, 1999. An additional student completed requirements during August of 1999, bringing the total to 27 graduates in the first class. Outcome data from present students, alumni, and employers reflect extremely high levels of satisfaction with the distance learning program. The second virtual graduation took place on May 15, 2001, with thirty-three graduates. A third class of ten students, located at four sites in the Continental United States, Puerto Rico, and the Virgin Islands, was recognized on May 13, 2003, during a virtual graduation ceremony. **Seventy individuals have successfully graduated from this exceptional distance learning program.** The program was halted following the third graduation because the VA had reached its target goal of Nurse Practitioners.

Summary. The experience gained by both the GSN and the VA will allow future projects in distance learning to benefit from the lessons learned and the technologies tested during the twenty-month, VA/DoD Distance Learning Program. Outcome evaluations continue with the early graduates and their supervisors. The technology continues to evolve to reflect the rapid growth of the field. The difficulties faced by the project coordinators in creating a new distance learning program utilizing the latest technologies were numerous and challenging; the GSN and the VA Departments, faculty, staff, and students who succeeded in doing so, were well pleased with their initial results and continued to work to improve their educational efforts in distance learning. A report was also submitted to the Congress as the VA and DoD response to a legislative directive for a summary report on the VA/DoD Distance Learning Program. To ensure that other Federal entities could easily access the lessons learned during this Program, a joint report was issued by the GSN and the VA Nursing Strategic Healthcare Group in November of 2000. The report, <u>The VA/DoD Post-Master Adult Nurse Practitioner Program: From Concept to Graduation</u>, documents, in chronological order, the formulation of the partnership between the DoD and the VA, the conceptual stages and developmental processes, learning strategies, course evolvement, assessment methodologies, clinical

experiences, and the transmission effectiveness (computer technology and video teleconferencing) for the entire program. In short, the report provides an inclusive roadmap for implementing a distance learning program - from concept to the matriculation of the second class. **Future initiatives between the GSN and the VA are being considered with an emphasis on improving nursing practice and health care for veterans.**

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IV. GRADUATE EDUCATION PROGRAMS

The Graduate Programs at USU are important to the University for many reasons. They help to train a cadre of well qualified, experienced biomedical scientists and public health practitioners who will continue the tradition of scientific service to the Nation in the civilian and military worlds. Strong Graduate Programs are important because of the major effect that active Graduate Programs have on the intellectual vitality of Departments and Programs. The presence of well-populated and thriving Graduate Programs is also an important factor in the recruitment of the best applicants for faculty positions at the University. USU Graduate Programs already serve these multiple needs.

Graduate student contributions to research in their mentors' laboratories form an important contribution to the overall productivity of research programs. We do not have complete statistics on the papers from USU faculty in which graduate students are listed as co-authors, but some information is available. Six Graduate Program Directors responded to a request to identify peer-reviewed papers with publication dates from 1996 to 2002 by faculty in their Programs in which students were identified as co-authors. ***A total of 108 peer-reviewed publications were identified across the six Programs, with 62 individual graduate students serving as co-authors*****. Publication rates vary considerably among Programs, reflecting the different search styles across biomedical research disciplines, and this is certainly an incomplete count of graduate student publications from USU.** ***The data support the contention that graduate students play an important role in maintaining and facilitating research productivity among USU faculty*****.**

- *VIII, Graduate Education in the Biomedical Sciences and Public Health,* Subcommittee Report, Middle States Association of Colleges and Schools (MSA) Self-Study, submitted to the Evaluation Team representing the Middle States Commission on Higher Education prior to their site visit on March 30-April 2, 2003.

ESTABLISHMENT

The Uniformed Services Health Professions Revitalization Act (Public Law 92-426) Established the University in 1972 and Directed the Establishment of Graduate Education Programs. Following Congress' establishment of the University and the School of Medicine, in 1972, the early founders understood that in order to gain and sustain accreditation, Graduate Education Programs had to be structured within the School of Medicine. The Liaison Committee on Medical Education (LCME) accreditation process is designed to certify that a medical program meets prescribed standards. It is recognized by both the LCME and the USU Board of Regents that graduate programs in the basic medical sciences leading to the Doctor of Philosophy Degree or to appropriate degrees at the Master Degree level are essential components of a School of Medicine dedicated to excellence in medical education.

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The Establishment of the Office of the Associate Dean for Graduate Education. In accordance with the requirement to ensure the academic excellence of the newly established Graduate Education Programs, the Dean of the USU School of Medicine (SOM) appointed **Colonel John W. Bullard, Ph.D., USA, (Retired), as the Assistant Dean of Graduate and Continuing Education Programs**. Doctor Bullard was recognized as one of the Army's experts on educational affairs, and in particular, continuing education. He had been a Medical Service Corps officer who had served in Vietnam and had been previously assigned to the Army Academy of the Health Sciences, the Office of the Surgeon General of the Army, and the Office of the Assistant Secretary of Defense for Health Affairs. The SOM admitted its first graduate students in 1977. During the early 1980's, in an effort to highlight the contributions of the Graduate Education Programs, Doctor Bullard began a research symposium to showcase the research contributions of the graduate students. Following Doctor Bullard's death in November of 1990, the Office of the Dean, SOM, with the concurrence of the USU President and Board of Regents, and in recognition of the importance of the Graduate Education Programs, determined that the leadership position for the Graduate Education Programs should be separated from the Continuing Education Programs and a subsequent search was held for the position of Assistant Dean for Graduate Education. **Michael N. Sheridan, Ph.D., Professor, USU Department of Anatomy and Cell Biology**, was selected as the second Assistant Dean for Graduate Education in 1991. The Dean, SOM, elevated the position to Associate Dean for Graduate Education in 1993; Doctor Sheridan served in that position until August of 2001, when **Cinda J. Helke, Ph.D., Professor of Pharmacology and Neuroscience**, was selected to serve as the Associate Dean for Graduate Education. In June of 2004, Doctor Helke passed away after a battle with cancer. **Eleanor S. Metcalf, Ph.D., Professor of Microbiology and Immunology and Director, Emerging Infectious Diseases Program,** was named Acting Associate Dean for Graduate Education in June of 2004; she continues to serve in the position while a national search for a new Associate Dean for Graduate Education is underway.

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Graduate Education Programs Provided at USU. The Doctoral and Masters Degree Programs available at USU are:

Interdisciplinary Ph.D. Programs in Emerging Infectious Diseases, Molecular and Cell Biology, and Neuroscience;

Departmentally-Based Ph.D. Programs in Clinical Psychology, Environmental Health Sciences, Medical Psychology, Medical Zoology, and Pathology;

Doctor of Public Health Program (DrPH);

Physician/Scientist (M.D./Ph.D.) Program;

Masters of Science Programs in Public Health and Molecular and Cell Biology;

Master of Comparative Medicine (MCM) Program;

Master of Public Health (MPH) Program;

Master of Tropical Medicine and Hygiene Program (MTM&H); and,

Master of Military Medical History.

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Graduate Education Programs Generate Cost Avoidance for DoD during 2004 - $1,340,000. Since the establishment of the USU SOM Graduate Education Programs in 1977, through April of 2005, a total of 845 advanced degrees have been granted by the University: 251 Doctors of Philosophy; 15 Doctors of Public Health; 82 Masters of Science; 457 Masters of Public Health; 8 Masters of Science in Public Health; 28 Masters of Tropical Medicine and Hygiene; and, 4 Masters of Military Medical History. During 2004, 38 uniformed officers received advanced degrees (34 Masters Degrees and 4 Doctoral Degrees); at an average cost of $30,000 per Master Degree (34 x $30,000 = $1,020,000) and $80,000 per Ph.D. or DrPH Degree (4 x $80,000 = $320,000), the USU SOM Graduate Education Programs generated $1,340,000 of cost-avoidance for the DoD during 2004. (Note: The average costs were estimated based on tuition and fees in biomedical graduate programs associated with medical schools in the National Capital Area (George Washington University, Georgetown University, University of Maryland at Baltimore, and John Hopkins University).

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MISSION

"The USUHS shall: ....4.3. Grant applicable advanced academic degrees; establish postdoctoral and postgraduate programs, and technological institutes; conduct medical readiness training and continuing education for members of the Uniformed Services in the health professions; and prepare individuals for careers in the health professions in the Uniformed Services."

- DoD Directive 5105.45, dated March 9, 2000, page two.

Mission Direction Calls for the Development of Graduate Education Programs. The goal of graduate study at the USU School of Medicine is to develop independent scholarship, originality, and competence in research, teaching, and professional service in the biomedical sciences and public health. This goal has guided the development of the Graduate Education Programs, which are designed for outstanding students committed to careers in the basic medical sciences, public health, or tropical medicine. The purpose of the Graduate Education Programs and their relationship to the School of Medicine were defined in the founding documents, which recognized that superior Graduate Education Programs in the basic medical sciences are an essential component in the accreditation process for a school of medicine.

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Graduate Education Programs Benefit the Military Health System. Graduate Education Programs in the basic medical sciences benefit the USU and the Military Medical System (MHS) as follows: 1) the Graduate Education Programs provide training opportunities for qualified active duty personnel of the Uniformed Services who receive authorization to participate in the USU graduate training programs under the sponsorship of their parent Services; 2) graduate students have the opportunity to become aware of the outstanding investigative programs, which are on-going in the Department of Defense laboratories located throughout the Washington, D.C. area. It is anticipated that the research institutes within the Department of Defense will be assisted in their recruitment of well qualified graduates on the basis of the mutual knowledge and respect developed during the graduate students' interactions at USU; 3) the academic environment of the SOM is maintained at a high level exposing the uniformed physicians-in-training to the disciplined methods of critical scientific inquiry, which are the rational basis of problem solving in medical science; 4) graduate students participate as teaching assistants and assist in the performance of instructional and investigative efforts, which are essential to the mission of the SOM and significant to the MHS; and, 5) doctoral programs and students are essential to attract and retain outstanding research faculty at USU.

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Responsiveness to the Needs of the Services.

Master of Military Medical History. A specific example of the USU Graduate Education Programs' direct response to the needs of the Surgeons General is the creation of a program for the Master of Military Medical History. This program is an outgrowth of the Fellowship in Military Medical History established at USU, in 1983, to train instructors of history for the United States Army Academy of the Health Sciences. A request was received from the Medical Service Corps of the Army to establish a degree granting program so that officers could continue to be used for the preservation of lessons learned and to fill history education/ teaching assignments at the Army Academy. Thus, the program was designed to meet the needs of Army officers in the Medical Service Corps Military Occupational Specialty (MOS) 70H, to prepare officers to serve as instructors in professional military medical education programs and for utilization as field historians for specific military medical issues. The program of study is currently limited to officers in the Medical Service Corps of the Army; four degrees have been granted in 1997, 1998, 2001 and 2003. The Program Director can be contacted by e-mail at <*dcsmith@usuhs.mil*> or at <*www.usuhs.mil/meh/gradprog.html*>.

The Graduate Program in Clinical Psychology Trains Clinical Psychologists to Serve in the Uniformed Services. The Graduate Program in Clinical Psychology is designed to train clinical psychologists to serve in the Uniformed Services. Students earn Master of Science (with master thesis) and Doctor of Philosophy (with doctoral dissertation) Degrees. This graduate program is designed to prepare broad-based Ph.D. clinical psychologists and to emphasize both an appreciation for, and an understanding of, the special needs of the Uniformed Services. The program trains clinical psychologists to be: effective providers of mental health services; creative problem solvers; critical thinkers sensitive to organizational needs and constraints; effective managers and communicators; and, professionals with the ability to evaluate processes and outcomes designed to improve the quality of health care. To accomplish these goals, the Ph.D. Program in Clinical Psychology follows the scientist-practitioner model of training. The program strongly values the development of knowledge and skills in applied clinical psychology and trains students to apply critical thinking skills to real world patients and situations, particularly in military and public health settings. The Ph.D. Degree requires independent scholarly work, comprehensive clinical training, a strong base in the foundations of psychology, and specialty training in uniformed clinical, health, and organizational psychology. A year-long, full-time clinical internship is also required for graduation. This program is open to individuals who currently are serving in, or who are eligible and willing to join, the Uniformed Services; and, it is accredited by the American Psychological Association (APA). A re-accreditation site-visit by the APA took place on January 29-30, 2004; the decision to grant reaccreditation through 2011 was reached during a meeting held on July 15-18, 2004. The Doctoral Program in Clinical Psychology will (continue to) be listed annually among accredited programs of professional psychology in the American Psychologist and on its Accreditation Web Pages (also discussed under the Accreditation section, which follows). Since 1996, 14 individuals have graduated from this Ph.D. Program; and, all but one of those 14 graduates continue to serve on active duty in the Uniformed Services. ***There are currently 8 students on campus enrolled in Clinical Psychology, in years one through four of the program***.

In 1997, a second track in this Doctoral Program was developed, the *Medical Psychology Clinical Track*; ***this second track has matriculated four students***. The Medical Psychology Clinical Track was also reaccredited during meetings held in July of 2004. The Program Director can be contacted by e-mail at <*mfeuerstein@usuhs.mil*>, <*csimmons@usuhs.*mil>, or at <*www.usuhs.mil/mps/Psychology/index.html*>.

The Physician Scientist Training Program (Medical Doctor/Doctor of Philosophy Program). The Medical Doctor/Doctor of Philosophy Program at USU was formally established during 2002, to train outstanding, dedicated, uniformed officers as independent physician-scientists to carry out both clinical investigations and biomedical research in the basic sciences. ***There are currently two students in this program***. This program combines a rigorous basic science graduate curriculum with outstanding clinical training, and uniquely integrated Medical Doctor/Doctor of Philosophy activities that qualify students for careers in academic medicine, biomedical and clinical research, as well as clinical practice. The decision to enter this Program is formidable and requires the student to dedicate seven to eight years toward completing this challenging combination of medical and scientific training. Entering students must demonstrate a high level of preparedness, outstanding academic credentials, motivation, and commitment to the goals of the Program. An M.D./Ph.D. Advisory Committee acts as an Admissions Committee and oversees the M.D./Ph.D. students during their entire Program at USU. Matriculants to the Program must maintain all requirements necessary to be commissioned into the Uniformed Services throughout the Doctor of Philosophy portion of his or her training. The student will complete all required courses for the Doctor of Philosophy during the first and second years, to include some of the courses required for the first two years of the SOM curriculum. The Qualifying Examination for advancement to candidacy will be taken at the end of the second year and a doctoral thesis proposal must be subsequently submitted. The third year will be a research year. The transition phase begins after the third year and lasts two years. The student must complete all requirements to be commissioned in the Uniformed Services and attend Officer Basic Training; and, the student will complete the remaining requirements of the first and second years of SOM curriculum as a uniformed officer. The student will also continue to spend significant time on his/her thesis research, finalizing the thesis project, and preparing and defending his/her doctoral dissertation. The Office of Student Affairs will share supervision of the student with the Graduate Education Office during this phase of training. The final component of the program is the clinical phase during the sixth and seventh years; the student will begin full-time participation in the SOM curriculum under the guidance of the Office of Student Affairs and complete all required clinical rotations and clerkships. Subsequent to the completion of all requirements, the student will be awarded both the Medical Doctor and the Doctor of Philosophy Degrees and commissioned as an active duty officer (0-3) at commencement. Additional information can be accessed at <*admissions@usuhs.mil*> or <*graduateprogram@usuhs.mil*>.

The Master of Comparative Medicine - An Interdisciplinary Program. This interdisciplinary Graduate Program offers the Master of Comparative Medicine (MCM). The MCM Program falls within the scope of graduate programs defined as appropriate for USU and responds to a specified need of the Uniformed Services and fosters a positive collaborative relationship with USU, the National Institutes of Health, the United States Public Health Service, and the Department of Army Medicine. This program fulfills the obligation undertaken by USU in 1993 to build a graduate degree program in support of Laboratory Animal Medicine (LAM) residency training. The MCM Program is the redesignation of graduate courses approved by the Graduate Education Committee for the USU Master of Public Health Degree Program in the Department of Preventive Medicine and Biometrics. The Comparative Medicine faculty consists largely of non-billeted LAM veterinarians and other USU faculty who qualify for secondary faculty appointments in the MCM Program. The leadership of the Program is provided by the Academic Administrative Committee; this committee evaluates candidates for matriculation, approves graduate programs of study, counsels students in difficulty, and recommends students for the awarding of a degree on completion of an approved program of study.

To support the National Institutes of Health (NIH) in the joint education of Federal Laboratory Animal Veterinarians, at the August 2002 meeting, the USU Board of Regents endorsed, on second reading, the creation of a Master of Comparative Medicine Degree in support of the need of the United States Public

Health Service for the education of commissioned corps veterinarians in Laboratory Animal Medicine related subjects. The President of USU authorized the admission of commissioned corps and other uniformed officers to the study of Comparative Medicine in the 2002-2003 Academic Year. In 2004, NIH requested that civilians, nominated by NIH, be admitted to the study of Comparative Medicine in association with the Uniformed Services University Laboratory Animal Residency Program. The policy limiting admissions to graduate study for the Master of Comparative Medicine Degree to uniformed students was modified by the USU President to permit civilians nominated by the NIH and admitted to the USU Laboratory Animal Residency Program to matriculate in the program during the Summer of 2004. ***Two students were enrolled in the MCM Program during August of 2004***.

Three Interdisciplinary Biomedical Graduate Training and Research Programs Relevant to the Needs of the Uniformed Services. The research and development goal described in the USU Strategic Plan is to build, sustain, and publicize interdisciplinary research programs relevant to the needs of the Uniformed Services. Currently, there are three interdisciplinary research programs:

The Interdisciplinary Program in Neuroscience. This Ph.D. Graduate Program is supported by faculty members whose primary appointments are established throughout the SOM departments. It provides a seminar series and a flexible program of courses and research areas for graduate students and postdoctoral fellows who have strong training in the biological, behavioral, and/or physical sciences. Research areas strongly represented by faculty include: development, regeneration, and plasticity in the nervous system; molecular neurobiology; and, adaptive responses of the nervous system to stress, injury, and a changing environment. Integrated interdisciplinary instruction in the development, structure, function, and pathology of the nervous system and its interaction with the environment is also included. ***Three students entered the Program in August of 2004***. During USU's May 2004 Commencement Ceremonies, two individuals (both civilian) received Doctoral Degrees; one of those students received the Board of Regents Award for the Graduate Program in Basic Medical Sciences. The Program Director can be contacted by e-mail at <*rarmstrong@usuhs.mil*> or at <*www.usuhs.mil/nes/home.html*>;

The Interdisciplinary Program in Molecular and Cell Biology. An Interdisciplinary Program in Molecular and Cell Biology (including Genetics) has been developed to contribute to cross-disciplinary interactions and to develop the critical skills needed for data presentation and analysis; the program also includes a seminar series and a journal club, all of which support the Ph.D. Degree Program. This interdisciplinary Ph.D. Degree Program offers training to address many of the fundamental questions of modern biology ranging from protein-nucleic acid interactions to cytokines, growth factors, and developmental biology. Prospective students should have a background in biological or chemical sciences; study for the Master Degree Program is available to uniformed officers. Research areas include: molecular biology of lymphocyte interactions; host-pathogen interactions; cell surface, cytoplasmic and nuclear receptor signaling pathways; exocrine secretory processes; and, gene targeting in mice to include a transgenic mouse facility for targeted gene disruption using homologous recombination. ***Two students entered the Program in August of 2004***. One civilian received a Doctoral Degree and one uniformed officer received a Master Degree during USU's May 2004 Commencement Ceremonies. The Program consists of faculty mainly from six SOM departments. The Program Director can be contacted by e-mail at <*jharmon@usuhs.mil*> or at <*www.usuhs.mil/mcb/index.html*>; and,

The Interdisciplinary Emerging Infectious Diseases Program. This interdisciplinary Ph.D. training program is designed primarily for individuals who wish to devote their graduate training to the study of the pathogenesis, host response, and epidemiology of infectious diseases. This academic program combines formal course work with research training provided by an interdisciplinary EID faculty. The mission of the EID Graduate Program is to provide the scientific community with broadly-trained, outstanding scientists who can contribute significantly to the increasingly complex field of infectious disease mechanisms and pathogenesis. The training goals of the program include the provision of a rigorous academic environment wherein trainees learn to ask well-informed questions, develop the research laboratory skills to answer those questions, expand their capacity to think creatively and broadly, and acquire the skills necessary to communicate their ideas and results both orally and in writing. ***The importance of accomplishing these educational goals in the interdisciplinary area of infectious diseases research cannot be underestimated given the increasing threats of bioterrorism and the risks associated with emerging and re-emerging infectious diseases***. The EID Program has three academic tracks: Microbiology/Immunology; Pathology; and, Preventive Medicine/Parasitology. The research training emphasizes modern methods in molecular biology, cell biology, and interdisciplinary approaches. ***Nine students entered the EID Program in August of 2004*** (a more detailed description of the program follows). The Program Director can be contacted by e-mail at <*emetcalf@usuhs.mil*> or at <*www.usuhs.mil/eid*>.

Additional Participants in the Interdisciplinary Programs. Additional academic departments that contribute extensively to the teaching and research training of doctoral and master degree students through interdisciplinary programs include: Anatomy, Physiology and Genetics; Biochemistry; Microbiology and Immunology; Pharmacology; and, many clinical departments such as Medicine, Neurology, Pediatrics, and Psychiatry.

The Interdisciplinary Graduate Program in Emerging Infectious Diseases.

Background. In August of 1999, the USU Board of Regents gave its final approval to the Graduate Program in Emerging Infectious Diseases (EID), an interdisciplinary Ph.D. training program designed primarily for individuals who wish to devote their graduate training to the study of the pathogenesis, host response, and epidemiology of infectious diseases. Development of expertise in infectious diseases is timely and of global importance given that the National Institutes of Health have estimated that at least 22 pathogens have been newly recognized or have re-emerged in the past two decades. With the addition of the EID Program, the SOM has increased its capacity and commitment to instruct students in the biology of infectious diseases, especially in areas of interest to uniformed medicine.

Both Uniformed and Civilian Students Are Matriculants in the EID Program. The EID Program is designed for both uniformed and civilian applicants who wish to pursue a program of study leading to the Ph.D. Degree in one of three academic tracks: Microbiology/Immunology; Pathology; or, Preventive Medicine/Parasitology. In addition, this program provides an opportunity for uniformed pediatric and adult Infectious Diseases Fellows to complete the research components of their Fellowships in Infectious Diseases. The inaugural graduate student class of 7 full-time students matriculated in the Fall of 2000. Since then, 31 uniformed and civilian students have entered the Program. Approximately 14 percent of the current students are military officers in the Medical Corps. Three classes have completed Qualifying Exams and the entering Class of 2003 will take Qualifying Exams in June of 2005. Selection of the incoming EID

class for the Fall of 2005 is underway. The number of applicants for the EID Program continued to increase during the past year; and, the program continues to have more outstanding applicants than it has stipends.

The University offers a unique opportunity for students interested in graduate training in the field of emerging and re-emerging infectious diseases because of the synergistic educational opportunities offered by a blend of clinical and basic science faculty, as well as the combination of civilian and uniformed faculty. In addition to the University-based thesis advisors for the EID students, a source of thesis advisors also includes faculty researchers from some of the preeminent infectious diseases research Institutes in the country: the Walter Reed Army Institute of Research (WRAIR); the Naval Medical Research Center (NMRC); the United States Army Medical Research Institute of Infectious Diseases (USAMRIID); and, the Armed Forces Institute of Pathology (AFIP). Joint training opportunities with faculty members at these Institutes who have USU faculty appointments will permit the EID Program to fulfill its training goals.

Realization of the Extent to which Basic Science Advances in the Area of Infectious Diseases Can Affect the Current and Future Health of Individuals throughout the Military Health System. The Emerging Infectious Diseases Program also serves as an opportunity for the facilitation of educational and scientific interactions between students and faculty at USU who share common interests in the contemporary approaches to the study of molecular biology, pathogenesis, and host responses within the context of emerging and re-emerging infectious diseases. The establishment of this program at USU by the SOM formally recognizes the breadth of disciplines spanned by emerging infectious diseases and the extent to which advances in these areas can affect the current and future health of individuals within the United States and also in the global arena. This situation is particularly critical and important given the recent events of bioterrorism. ***As part of the EID Program, courses on the agents and effects of bioterrorism are offered. To date, this program is one of the only graduate programs in the country to offer formal training in this critical area.*** The implementation of an interdisciplinary and interdepartmental Program in Emerging Infectious Diseases will also broaden and enhance the overall educational objectives of USU and bring together faculty and students in a scientific community designed to stimulate and promote collaborative interactions. ***Since the USU SOM is one of the only schools of medicine that offers a formal program in EID, the University plans to be at the forefront of training broadly-based uniformed and civilian infectious diseases scientists for the future.*** As indicated above, the Program Director can be contacted by e-mail at <*emetcalf@usuhs.mil*> or at <*www.usuhs.mil/eid*>.

The Graduate Education Programs in Preventive Medicine and Public Health Address the Special Needs of the Military Health System.

The USUHS SOM Graduate Education Programs in Public Health, with their emphasis on community health, rank sixth in the Nation according to U.S. News & World Report's *2004 Edition of America's Best Graduate Schools* on the list of the top 10 community health master or doctorate programs."

- **The Honorable David S. Chu, Under Secretary of Defense for Personnel & Readiness,** Nomination Statement to Accompany the Award of the DoD Medal for Distinguished Civilian Service, Presented to the USU President on August 2, 2004.

The USU SOM Department of Preventive Medicine and Biometrics (PMB) offers programs of study leading to the Master of Public Health (MPH), Master of Tropical Medicine and Hygiene (MTM&H), Master of Science in Public Health (MSPH), Doctor of Public Health (DrPH), and Doctor of Philosophy (Ph.D.) in Medical Zoology and Environmental Health Sciences. Between 1983 and April of 2005, 520 individuals have earned the following graduate degrees: MPH - 457; MSPH - 8; MTM&H - 28; MS - 1; DrPH - 15; and, Ph.D. - 11. During 2004, 43 candidates in the PMB Department were awarded advanced degrees: 2 Doctors of Philosophy; 3 Doctors of Public Health; 37 Masters of Public Health; and, 1 Master of Science in Public Health. The PMB Department has continued to attract candidates for its graduate degree programs, which are of particular relevance to the Uniformed Services. Fifty students are currently enrolled in the Masters or Doctoral Programs. With its stated mission ...***to enhance and protect the health of members of the Uniformed Services by producing knowledgeable and highly skilled public health professionals***... the PMB Department has sought to be responsive to the needs of its customers in the DoD and the United States Public Health Service; and, this is reflected in the types of programs and training offered at USU. PMB has continued its collaborative educational agreements with the Walter Reed Army Medical Center Preventive Medicine Residency Program and Internal Medicine Fellowship Program, the Army Program for Training in Health Services Administration, the Army Laboratory Animal Medicine Program, the Navy Dental Research Institute Program in Dental Public Health, and the Indian Health Service Environmental Health Training Program. In addition, the PMB Department remains affiliated with the United States Army and Navy Overseas Biomedical Research Laboratories in Bangkok, Thailand; Rio de Janeiro, Brazil; Nairobi, Kenya; Cairo, Egypt; Jakarta, Indonesia; and, Lima, Peru. These overseas laboratories provide excellent opportunities for students in the MTM&H Program, which includes a six-week overseas clinical experience in tropical medicine. A research program also exists under an agreement with the Ministry of Health in Belize.

Demographics of the Graduate Program in Public Health. The class composition, as of April 2005, reflects a wide range of backgrounds and experience among the ***50*** students currently enrolled in either the Masters or Doctoral Programs. The ***27 Masters Degree students in the MPH and MTM&H Programs*** include 18 Physicians (17 uniformed officers and 1 civilian), 4 Veterinarians (2 Air Force Public Health Officers, 2 Laboratory Animal Medicine Residents), 1 Environmental Science Officer, 2 Aerospace Physiologists, 1 civilian (undergraduate biology major), and 1 civilian Nurse-midwife. The ***13 students in the MSPH Program*** include 7 Air Force Bioenvironmental Engineers, 3 Health Physicists (2 Air Force, 1 Navy), and 3 Industrial Hygienists (2 Army, 1 Navy). These programs are designed for students with at least three years of experience in a health-related field. Residents in General Preventive Medicine/Public Health (GPM) and Occupational and Environmental Medicine (OEM) take courses and meet all of the requirements for the MPH or MTM&H Degrees during year one of their residency training. Nine of the 27 MPH/MTM&H students are in the USU GPM or OEM Residency Programs. The ***ten Doctoral students*** include 6 Doctor of Public Health students/candidates (1 uniformed officer, 5 civilians) and 4 Doctor of Philosophy candidates (all uniformed officers). The Program Director can be contacted by e-mail at <*www.usuhs.mil/pmb/pmb.html*>.

The outstanding response of the Department of Preventive Medicine and Biometrics to the requirements of the Uniformed Services is documented by the following selected examples:

The Occupational Ergonomics Program. Recognizing the importance of occupational musculoskeletal injuries among military personnel and in response to the Army's request for specialty training in occupational ergonomics within the MPH Program, an area of concentration was established,

the Occupational Ergonomics Concentration in the Department of Preventive Medicine and Biometrics Master of Public Health Program, with faculty involvement from the Department of Medical and Clinical Psychology and the United States Army Center for Health Promotion and Preventive Medicine. The program offers courses in ergonomics, injury control, and health and safety. A number of students have completed their MPH research in this area. Recently, this program conducted a major study with significant health care implications for the military. The research, which focused on how the military manages low back pain, a major public health challenge, indicated that improved integration of ergonomic and psychosocial factors into direct health care actually improves health outcomes while cutting health care costs. *The Occupational Ergonomics Program is the only established graduate-level injury prevention program in the Department of Defense*;

The International Health Specialist (IHS) Program was initiated in 1999 under the guidance of **Lieutenant General Paul K. Carlton, Jr., Surgeon General of the Air Force**. Numerous After Action Reports (AARs) indicated that Humanitarian Assistance (HA) and Disaster Response (DR) missions would benefit if members of the Air Force Medical System (AFMS) received additional training. The goal of the IHS Program is to prepare regionally-focused military medical experts to support the Combatant Commander's Theater Engagement Plans. Individuals selected for the positions may attend short courses or degree programs, i.e., the Master of Public Heath (MPH) Degree with a regional, humanitarian assistance, disaster response, or international health focus. A memorandum of understanding was signed between the Office of the Air Force Surgeon General and USU during November of 2001, to design, test, and implement an educational and academic curriculum for the IHS Program; this memorandum is currently under revision.

The USU/SOM MPH Program is a 12-month program consisting of 60 quarter credit hours; in addition to the MPH requirements, the IHS students are required to take: International Health I; International Health II; Medical Anthropology; Joint Medical Operations and Humanitarian Assistance; Public Health Issues in Disasters; and, Introduction to Epidemiology II. Furthermore, IHS students must also select two additional electives from the following courses: Program Planning & Development; Principles and Practice of Tropical Medicine; Malaria Epidemiology and Control; Travel Medicine Practicum; and, Deployment Environmental Exposures. IHS graduates are expected to use their acquired quantitative and analytical skills in biostatistics and epidemiology to identify and measure population health needs and to investigate the impact of biological, environmental, and/or behavioral factors in solving public health problems. Each graduate understands the components, operations, and financing of health delivery services and has the administrative skills to plan, analyze, manage, and improve public health programs for the Uniformed Services. The graduates also understand the role that the United States military and other organizations and agencies play in addressing global health issues. Additionally, the graduates are able to apply public health principles in assessing international health needs and in the planning, conducting, and evaluating of international health-related activities and projects. ***Eight students have graduated with an MPH/IH concentration since 2003;***

The Ph.D. Program in Environmental Health Science was established in response to identified needs within the Uniformed Services. ***As of this time, two Ph.D. Degrees have been awarded, with the first granted in 2003***. Two active duty Naval officers are currently enrolled in the Ph.D. program; two active duty officers (1 Navy, 1 Army) will begin this Ph.D. Program in August of 2005;

The Master of Science in Public Health (MSPH) Program has graduated eight degree candidates between 2000 and April of 2005. Thirteen Navy, Air Force, and Army officers are currently enrolled in the Environmental and Occupational Health and the Health Physics specialties in the MSPH Program; two of these students are expected to graduate in 2005. The students and program faculty work closely with the Services and other Federal and international organizations to identify and address current needs for operational forces and emergency responders. Past and current projects have included the development of chemical warfare detection methods and instrumentation;

The Aviation Physiology Specialty Track in the Master in Public Health Program has been offered for the past five years. In addition to Aerospace Operational Physiology I and Aerospace Operational Physiology II, Human Factors in Aviation, and Introduction to Risk Communication, two electives are selected from among the following: Special Topics in Aerospace Medicine; Aerospace Medicine in the Modern Age; Aerospace Exercise Physiology; Aerospace Performance & Health; Joint Medical Operations and Humanitarian Assistance; and, Health Effects of Ionizing/Non-Ionizing Radiation. This course of study prepares students not only for successful negotiation of the Aerospace Physiology Society's Board Certification Process, but also for a career in the military as an Aerospace Physiologist. ***Since 1999, nine students have completed the program and three students have audited it.*** With an additional physiologist expected from the Air Force in 2005, further expansion of offerings will continue;

The TriService Advanced Military Tropical Medicine Course has been offered at USU, beginning in 1996, through the Summer of 2004. During 2004, 82 military medical officer students were trained in operational military medicine, consisting of four weeks of lectures and laboratories in the advanced diagnosis and treatment of tropical diseases. Approximately 70 lecturers provided over 106.5 hours of didactic instruction. ***To date, over 505 students have completed the course.*** One hundred and thirteen continuing medical education hours (CME) were awarded during the past year; and, the overseas field missions were attended by 50 medical officers (El Salvador - 10; Bolivia - 10; Peru - 11; Guyana - 11; Cairo - 6; and, Thailand - 2). ***A medical officer used the training received in this course to make the initial diagnosis of malaria during the outbreak of malaria in Joint Task Force Liberia personnel in 2003; an action that very likely prevented disability and saved lives***;

The Tropical Medicine and Travelers' Health Course is offered as a 12-week course during the Spring Quarter of the MPH Program. It includes lecture, seminar, laboratory and case-based curriculum approved by the American Society of Tropical Medicine and Hygiene and leads to eligibility for the qualifying examination in Tropical Medicine and Travelers' Health. ***To date, 37 uniformed medical officers and 14 civilian physicians have completed the course***;

The Diagnostic Parasitology Course is offered as a series of lectures and hands-on laboratory sessions for individuals wishing to study parasitic infections in humans. Uniformed and civilian medical technologists and physicians from all parts of the world have completed this course. Participants for the course have included: United States Embassy personnel from Asian and African countries sent by the United States Department of State; members of the Peace Corps; a medical doctor from the Japan Ground Self Defense Force; and, civilians from various foreign and domestic health related organizations. ***Since 1988, over 300 individuals have taken the course, to include 9 individuals who took the course during 2004***; and,

Medical Executive Skills Program (MedExec) was designed in response to a Congressional mandate that current and prospective DoD health care leaders receive training in health care management and administration. Both face-to-face and distance learning are included in the Program. In 2004, three modules were added to the MedXellence Distance Learning Program: Patient Feedback; Executive Management of Clinical Investigation Programs; and, HIPAA. Modules in financial management and modeling, as well as family-centered care, were added to the MedXellence on-site classes. ***Integrating Clinical and Managerial Decisions to Improve Population Health***, a five-day in-class portion of the MedExec Program, is held five times each year throughout CONUS and Atlantic and Pacific TRICARE Regions. ***To date, 37 sessions have been held in the TRICARE Regions and over 1,000 senior officers have been trained for the MHS***.

(See Section II of this document, *The USU SOM Department of Preventive Medicine and Biometrics and the Centers for Preventive Medicine and Public Health*, for further discussion.)

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ACADEMIC REQUIREMENTS AND ACCREDITATION

Academic Excellence and Uniformity Ensure Accreditation. To ensure academic excellence within the Graduate Education Programs, in addition to the oversight and reviews provided by the Graduate Education Committee and the academic departments, a series of requirements for the Doctor of Philosophy Degree (Ph.D.) have been established. Some departments have established additional requirements. The minimum residency requirement for the Ph.D. is 36 months of full-time study; but, it may be less if a student holds an advanced degree. All requirements must be completed no later than seven years after matriculation. Formal course work, participation as teaching assistants in the SOM teaching programs, and directed research activities are all components of a student's predoctoral program. Full-time status is defined as 12 or more credit hours each quarter. The minimum course work requirement for the doctorate is 48 graded credit hours and the minimum for total academic credit is 144 credit hours. A qualifying examination (comprehensive examination) is conducted and graded by a committee of graduate faculty. A written dissertation based on the original experimental research, or an alternative thesis format, differentiated by the materials and methods section and results section, in the form of acceptable peer-reviewed publications is required. A total of 24 credit hours of graduate course work taken within the last 5 years at other academic institutions, either before admission to the SOM or during study at USU, may be transferred, provided such courses are equivalent to courses at the SOM and are approved by the graduate faculty of the specific program and the Graduate Education Committee. Some departments' Ph.D. Programs of Study encompass an independent project whereby the student will receive a Master Degree while pursuing the Ph.D. Requirements are designed to ensure academic excellence and uniformity in degree programs across the departments. An approved thesis is required of all candidates for the Master of Science Degree. A thesis is not required for the Master of Public Health or the Master of Tropical Medicine and Hygiene; but, an independent project paper must be completed to fulfill requirements for these degrees.

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The Graduate Education Committee Reviews Ensure the Quality of the Programs. Each Graduate Education Program is managed by a Program Director. The Graduate Education Committee (GEC) is composed of the Graduate Program Directors, representatives from the Basic Science Departments, the Associate Dean for Graduate Education, the Vice President for Teaching and Research Support, two members of the faculty appointed by the Dean, SOM, and a Graduate Student Representative. The GEC is responsible for periodic reviews of the policies and procedures of each Graduate Program, reviews of academic records and other aspects of graduate student standing, and the monitoring of the overall quality of graduate student life at the University. In addition, all graduate courses must be submitted to the GEC for consideration and approval prior to offering (***over 492 individual graduate education courses have been established by the participating faculty***). Significant changes to previously approved courses must also be considered by the GEC prior to incorporation. Departmental faculty annually review and update the graduate course offerings for each program. Some departments rely upon SOM course offerings for their Graduate Program curricula, supplemented by graduate course offerings. Some SOM courses have been subdivided into individual graduate offerings, allowing graduate students to take appropriate parts of a larger course. The GEC makes recommendations on its areas of responsibility to the Dean, SOM, through the Associate Dean for Graduate Education. Following the 1999 SOM Self Study, no major revisions were recommended for the Graduate Education Programs. The recent Self-Study for the Middle States Commission on Higher Education points out that "the USU graduate programs have continued to mature and develop with new interdisciplinary programs (e.g., Emerging Infectious Diseases) and programs targeted toward military needs (Undersea Medicine, Aviation Physiology) being initiated in the past five years.

These programs take advantage of unique faculty expertise and other resources and opportunities unique to a Federal health sciences university. In addition, the Office of Graduate Education implements a regular formal process of external review of its graduate programs to assure that high quality programs are fostered and maintained" (*VIII, Graduate Education in the Biomedical Sciences and Public Health*, Subcommittee Report, Middle States Commission on Higher Education Self Study, submitted for the March 30-April 2, 2003 Site Visit, page 8).

Within the last several years, each of the established Graduate Degree Granting Programs, subsequent to the preparation of a detailed self-study, was site-visited and reviewed by an external team of graduate educators. During the initial review cycle, the Neuroscience Program, Programs in the Medical and Clinical Psychology Department, the Anatomy, Physiology and Genetics Department, and the Pharmacology Department were evaluated. In 2001, the Molecular and Cell Biology Program and the Programs of the Pathology Department and the Department of Microbiology and Immunology were externally reviewed. Constructive improvements to the Graduate Education Programs have resulted from these external reviews. Newer programs, including the Emerging Infectious Disease Program and the Master of Comparative Medicine Program will be externally reviewed within the next few years. This external review process is intended to bring attention to the strengths and weaknesses of the programs and to appropriately focus institutional resources for graduate education.

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Accreditation of USU Graduate Education Programs. Accreditation of the USU Graduate Education Programs is granted by four entities: the Middle States Commission on Higher Education; the Council on Education for Public Health; the American Board of Electronic Technology; and, the American Psychological Association.

The Middle States Commission on Higher Education. The Graduate Education Programs, as an integral part of the SOM and the SOM Office of Graduate Education, are reviewed by the Middle States Commission on Higher Education; ***the Graduate Education Programs are included in the recent ten-year accreditation granted by the Middle States Commission on Higher Education through 2013***.

The Council on Education for Public Health. Given the mission of USU and the importance of prevention to uniformed medicine, the USU SOM Department of Preventive Medicine and Biometrics (PMB) is a large and vital part of the medical school and the University. In addition to accreditation by the Middle States Commission on Higher Education as a Department within the SOM, the PMB graduate programs are nationally accredited by the Council on Education for Public Health (CEPH). CEPH is the recognized accrediting body for Schools of Public Health and Graduate Programs in Community Health Education and Preventive Medicine/Community Health. The PMB Graduate Programs were initially accredited by CEPH in 1985 and were last reviewed in 1998. As part of the CEPH report following the last site visit in June of 1998, it was noted that "*the values of the institution and the philosophy of military medicine are an exceptionally good fit with the values and philosophy which underlie public health and preventive medicine. The program has strong ties to the military community, both locally and worldwide, and the instructional programs have particular relevance to the needs of the Uniformed Services to which the program graduates will return after their training. The curriculum is quantitatively-oriented and rigorous*." The PMB Graduate Programs are fully accredited through 2005. Currently, the faculty is in the final stages of a self-study and is scheduled to host site visitors in November of 2005.

The PMB Department has continued to embrace on-going program review and evaluation for continuous quality improvement, including efforts to identify measurable program outcomes. In addition to the rigorous, quantitatively-focused curriculum (60 credit hours), students are required to complete a 108-hour practicum experience, as well as an independent project for the MPH or MTM&H Degrees. Greater emphasis has been placed on basic research methodology and students are encouraged to present the results of their independent projects at scientific meetings and to prepare manuscripts for submission to peer-reviewed journals. The **Director, Graduate Programs, Colonel Gary D. Gackstetter, DVM, MPH, Ph.D., USAF, BSC, Associate Professor and Vice Chair for Graduate Education, PMB Department, USU SOM,** can be contacted by e-mail at <*ggackstetter@usuhs.mil*> or at <*www.usuhs.mil/pmb/pmb.html*>.

ABET Certification for the Division of Environmental and Occupational Health. The USU SOM Department of Preventive Medicine and Biometrics (PMB) submitted an application for accreditation from the ABET, a graduate engineering accrediting board, in support of PMB's Environmental and Occupational Health Division Industrial Hygiene and Health Physics specialty tracks in October of 2003; ***the review process was completed in July of 2004 and the program received national accreditation/certification for five years.***

Clinical Psychology Program Receives Accreditation. The Department of Medical and Clinical Psychology's Clinical Psychology Ph.D. Program has enjoyed on-going accreditation from the American Psychology Association's Committee on Accreditation. The program received its initial accreditation in record time and has since been listed annually among accredited programs of professional psychology in the American Psychologist. The initial site visit report stressed that *the curriculum is clearly articulated and appropriately sequenced, and the practicums are organized. Well-qualified and accessible, the faculty provides excellent role models for students. Also commendable is the program's commitment to systematic self-evaluation*. ***The Clinical Psychology Ph.D Program recently had its second review by site visitors on behalf of the APA; the re-accreditation process was a positive one. Formal notice of re-accreditation for a maximum term of 7 years was dated August 16, 2004; the next site visit is scheduled for 2011.*** The APA Accreditation Committee found that *the program is based on a solid scientific foundation of psychology and the science of clinical practice*. Doctoral programs and research in this area emphasize the application of psychology to behavioral medicine and to clinical psychology. Study in applied areas on the interface of health, psychology, and behavior, and in the basic areas of psychology is offered. This American Psychological Association-accredited Clinical Psychology Ph.D. Program is offered to selected members of the Uniformed Services. ***A second track in this Doctoral Program was developed in 1997, the Medical Psychology Clinical Track; the new track was also evaluated during the recent re-accreditation visit by the APA and also received reaccreditation for an additional 7 years with the next site visit to be held in 2011***. The Program Director can be contacted by e-mail at <*mfuerstein@usuhs.mil*>, <*csimmons@usuhs.mil*>, or at <*www.usuhs.mil/mps/Psychology/index.html*>.

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ACADEMIC RESOURCE FOR THE UNIFORMED SERVICES

The Development of Independent Scholarship. The goal of graduate study in the biomedical sciences and public health at USU is to develop independent scholarship, originality, and competence in research, in teaching, and in professional service to the Nation. The Graduate Education Programs are designed for outstanding students with a strong commitment toward permanent careers in the basic medical sciences and, potentially, in the Federal Government. Within each Ph.D. Program, an individualized course of study is designed for each student to meet his or her specific needs **(***over 492 individual graduate education courses have been established by the participating faculty at USU*). The graduate programs are open to qualified civilian and uniformed personnel. Students accepted for graduate study are generally enrolled on a full-time basis. They assist in the performance of the instructional and investigative efforts that are carried out at the University. Active duty military and uniformed services personnel must obtain the approval and sponsorship of their parent Service; they also incur an obligation for additional service, in accordance with the regulations of their parent Services that govern sponsored graduate education. Most of these officers will complete careers in their parent Services and use their graduate education and training to fulfill specific assignments for their Surgeons General and the Military Health System.

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The Faculty of the Graduate Education Programs Ensure an Individualized Program Built on Quality Research and Instruction. All Graduate Programs have sufficient full-time faculty to accommodate the present advising needs for the students in the Graduate Education Programs. Most Graduate Programs reported in recent SOM Self-Studies that additional students are desired and could be accommodated without placing undue demand on existing faculty resources. All Graduate Programs have a faculty/student ratio that provides excellent opportunities for continuous interaction; and, large numbers of both basic science and clinical science faculty members are involved in the didactic and research training of USU graduate students. ***The November 15, 2004 USU Faculty Listing reported 195 civilian and 110 uniformed faculty members in the USU SOM; and, over 150 of those 305 SOM faculty members were actively supporting the Graduate Education Programs, which currently include approximately 160 graduate education students.*** Formal occasions for faculty and graduate student interactions occur through seminars, journal clubs, research laboratory rotations, and courses; opportunities abound for students to interact with faculty on an informal and regular basis.

A faculty actively involved in research is critical to the success of the Graduate Education Programs. Through their research activities, high quality faculty members maintain themselves at the cutting edge of their various disciplines. Thus, they contribute to the research mission of the SOM by making advances in medically related research; and, they are also better equipped to function as *state-of-the-art* educators. The productivity of the USU SOM research faculty, the quality of their research, and their ability to successfully compete for extramural and intramural funding are all indications of the success of the USU research mission. The presence of strong Graduate Education Programs contributes to this success and is essential not only for the continued growth of the research activities at the University, but also for the future of medical research and education. The SOM Graduate Education Programs are clearly recognized by the institution as essential to achieving success in the University's research mission. Departments with active and vigorous graduate programs show high research productivity. USU graduate education students regularly present their research at professional meetings and publish their findings in peer-reviewed scientific journals, thus publicizing and promoting the University's reputation. The University's reputation is also enhanced by the success of its graduates to secure postdoctoral positions in highly regarded public and

private research laboratories, followed by faculty appointments or positions of responsibility in government research, regulatory agencies, and private industry.

2004 School of Medicine Biomedical Graduate Educator Award. As part of the 2004 USU Graduation Ceremonies, **William E. Gause, Ph.D., Department of Microbiology and Immunology,** received the Biomedical Graduate Educator Award. This award recognizes the outstanding contributions of a member of the USU biomedical graduate faculty in the School of Medicine. Doctor Gause has demonstrated commitment to graduate education through his many extensive and outstanding contributions to the education of students in the SOM graduate doctoral training programs. His skilled, personable, and interactive training style has positively affected each of the USU students who have had the opportunity to interact with him. His excellence in mentoring graduate students is clearly shown by the numerous achievements and successes of his doctoral dissertation students.

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Research Facilities Are Well Equipped and Support the Graduate Education Programs. The Graduate Education Programs are conducted in facilities on the campus of USU. Well-equipped, state-of-the-art laboratories are available to support the wide variety of research projects directed by the faculty in the basic medical sciences. Individual laboratories and core facilities are well-equipped with the instrumentation required for modern biomedical research. Special resources include the following: high resolution transmission and scanning electron microscopes; video-based computer graphics and confocal microscopy; a central resource facility providing custom synthesis of oligonucleotides and peptides; biohazard containment laboratories; a centralized animal resources facility; a medical library; computer support to include orientation to web sites and the Internet; and, a learning resources center. Students can enhance their educational experiences at USU through collaboration with the National Institutes of Health, the Library of Medicine, the Naval Medical Research Command, the Walter Reed Army Institute of Research, the Armed Forces Institute of Pathology, the Armed Forces Radiobiology Research Institute, the National Institute of Standards and Technology, numerous biotechnology companies, and other major institutions in the area.

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The 2004 Graduate Student Research Colloquium. The Graduate Student Research Colloquium was begun in 1980 to promote scholarly interchange between graduate students and the academic community at USU and to recognize the research achievements of USU graduate students. The 24th Annual Graduate Research Colloquium, sponsored by the graduate faculty and students, featured six oral presentations and 20 poster presentations of original research conducted by 26 graduate students. *The John W. Bullard Colloquium Lecture* followed the student presentations.

The 2004 Bullard Colloquium Lecture was presented by **James E. Darnell, Jr., M.D., Vincent Astor Professor Emeritus, Rockefeller University,** on *Transcription Factors and Cancer*. Doctor Darnell has been a leader in researching how genes and molecular signaling control cell processes. More recently, his many scientific achievements include the discovery of a pathway by which *molecular cues* on the outside surface of a cell signal the genes in that cell's nucleus to take specific actions. The relevance of Doctor Darnell's gene regulation research to human health is illustrated by his discovery of a cell-signaling route called the *JAK-STAT Pathway*, a pathway that has yielded important new insights into the biology of human cancers.

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STUDENT AFFAIRS

1981 - **Stephen Huot is the first basic science graduate program student to be awarded a Ph.D. in physiology** (as of April 2005, a total of 266 Doctoral Degrees have been granted)**.**

2004 - **USU holds its 25th Commencement Exercise on May 15 at the Daughters of the American Revolution Constitution Hall in Washington, D.C. More than 3,587 medical diplomas, 833 basic science doctoral and masters degrees** (845 as of April 2005)**, and 231 nursing degrees have been awarded to date.**

- **Ms. Sharon Willis, USU Office of Alumni Affairs,** USU Medicine, *USU Through the Years*, Summer 2004.

Selection of Students. A formal application is required of all persons seeking admission to graduate study at USU. Applications and all supporting documentation must be received no later than January 15th for programs beginning in the following August; there is no application fee. Applicants must have completed a Baccalaureate Degree Program from an accredited academic institution and have taken the Graduate Record Examination (GRE) before matriculation at USU. The GRE may be waived if the applicant possesses an advanced academic degree. All graduate students are admitted to a program of graduate study on a full-time, or part-time, basis and assist in the teaching and research programs that are integral components of the Graduate Education Programs in which they are enrolled.

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Demographics and Qualifications of the Student Body. Fifty-two students matriculated into the Graduate Programs of the SOM during August of 2004. Of those, 23 were admitted to Ph.D. Degree Programs and 29 were admitted to Masters Degree Programs. Of the Ph.D. matriculants, the greatest number enrolled in the interdisciplinary research programs: Emerging Infectious Diseases Program - 9 students; the Neuroscience Program - 3 students; and, the Molecular and Cell Biology Program - 2 students. Departmentally-based programs in Medical and Clinical Psychology enrolled 6 students; Preventive Medicine and Biometrics enrolled 2 students; and, Pathology enrolled 1 student. The 29 matriculating students in Masters Degree Programs enrolled in the graduate programs of the Department of Preventive Medicine and Biometrics (27) and the Master in Comparative Medicine Program (2).

The 160 students currently enrolled in the Doctoral and Masters Degree Programs at USU come from all parts of the country, from all types of undergraduate academic institutions, and from many different career-paths. Of these individuals, 114 are Ph.D. or DrPH students, while 46 are Master Degree candidates. Approximately 45 percent of the graduate students attend USU as active duty members of the Uniformed Services, to include the United States Army, Navy, Air Force, and Public Health Service. Most students are enrolled on a full-time status; however, a few exceptional students are accepted into degree-granting programs as part-time students. The MPH Program is generally completed in one year (as a full-time student); the Masters of Science Degree Programs take approximately two years to complete; and, the Doctoral Programs take from three to seven years to complete (four to five years is the average time for a Ph.D).

Active-duty uniformed personnel accepted to study full-time must have the consent and sponsorship of their parent Services and incur a service obligation to the United States Government after the completion of their graduate training programs. The University offers USU-supported stipends on a competitive basis to civilian doctoral students who are United States Citizens or resident aliens. Forty-nine of the civilian Ph.D. students receive USU-supported stipends; other civilian doctoral students receive stipend support from other sources.

Applicants must have completed a Bachelor Degree from an accredited academic institution prior to enrollment; they must arrange for: official transcripts of all prior college-level courses; GRE scores taken within the last two years; and, letters of recommendation from three individuals who are familiar with their academic work. Information and application forms can be downloaded from <*http://www.usuhs.mil/geo/gradpgm/index.html*>.

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25th Commencement - May 15, 2004. Approximately 2,000 family members and guests attended the 25th Commencement Ceremony at the Daughters of the American Resolution Constitution Hall in Washington, D.D., on May 15, 2004. During the graduation ceremony, the following School of Medicine Graduate Education Programs were recognized in the commencement program: 10 Doctor of Philosophy Degrees; 3 Doctor of Public Health Degrees; 1 Master of Science Degree; 2 Masters of Tropical Medicine and Hygiene Degrees; 31 Masters of Public Health Degrees; and, 1 Master of Science in Public Health Degree.

The USU Graduate Education Programs Have Granted a Total of 845 Degrees. Since the establishment of the USU SOM Graduate Education Programs in 1977, through April of 2005, the Graduate Education Programs have granted a total of 845 Doctoral and Master Degrees in the Biomedical Sciences and Public Health: 251 - Doctor of Philosophy; 15 - Doctor of Public Health; 82 - Masters of Science; 457 - Masters of Public Health; 8 - Masters of Science in Public Health; 28 - Masters of Tropical Medicine and Hygiene; and, 4 Masters of Military Medical History. During 2004, 38 uniformed officers received advanced degrees (34 Masters Degrees and 4 Doctoral Degrees).

The 2004 Graduate Student Award. The Graduate Student Award was presented to **Joshua Murti, Ph.D.** This award was presented during the 2004 USU Graduation Ceremonies to recognize this graduating student for his outstanding and exceptional service rendered to the student body, medical school, and the University. During the graduation ceremonies, Mr. Murti received a Doctor of Philosophy Degree for his work in the Molecular and Cell Biology Graduate Program. This award recognizes Doctor Murti's academic achievements, participation in the academic and intellectual life of the community, and contributions to the welfare and morale of other graduate and medical students.

The Henry M. Jackson Foundation Fellowship in Medical Sciences Awards. The Henry M. Jackson Foundation inaugurated three Foundation Fellowships to provide stipend and travel support for outstanding civilian graduate students during the terminal year of their programs of doctoral study at the Uniformed Services University. The recipients of the HMJ Fellowships, acknowledged at the 2004 Commencement, were **Andrea McCoy, Molecular and Cell Biology Graduate Program, Tyler Best, Neuroscience Graduate Program,** and **Kathryn Roecklein, Department of Medical and Clinical Psychology Graduate Program.**

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ALUMNI AFFAIRS

Overview of the Preparation of Graduate Students for Appropriate Career Opportunities. (The following is taken from the *VIII, Graduate Education in the Biomedical Sciences and Public Health*, Subcommittee Report, Middle States Commission on Higher Education Self Study, submitted in preparation for the 2003 Site Visit, pages 3-5.)

Graduates of USU Ph.D. Programs, as with Biomedical Ph.D. Programs everywhere, usually enter post-doctoral programs immediately after graduation, and many take a second post-doctoral position before finding a career level position. Program Directors and the major advisors of most USU graduates are generally aware of the first appointment obtained by graduates, but have much less complete information about the graduates' activities subsequent to their first postdoctoral appointment. Informal discussion with Program Directors suggests that USU graduates appear to have no difficulty in obtaining good post-doctoral appointments. Many of the post-doctoral appointments taken up by USU graduates are obtained in response to letters to USU faculty mentors from schools seeking USU graduates for position vacancies. These letters reflect the high standing in their professional field that many USU faculty mentors hold; they also indicate that USU SOM Graduate Education Programs are regarded as a source of productive post-doctoral fellows.

Following post-doctoral appointments, USU Program Directors are aware that graduates of USU Doctoral Programs enter a wide range of positions. The University's location in Bethesda, Maryland, leads to appointments in government research laboratories. Thus, of 25 Ph.D. graduates of the Microbiology and Immunology Program whose positions were known at five years after graduation, 32 percent (9) held career positions in Federal or state research laboratories or research regulatory and management agencies; and, 55 percent (11) of the graduates of the Medical Psychology Program held similar appointments. Graduates of the smaller graduate programs also held appointments in government research and regulatory agencies. These positions are held in a diverse range of research, research management, or regulatory affairs positions within Federal or state research organizations. They include the National Institutes of Health and the Virginia State Department of Agriculture and Consumer Services Disease Center located in Ames, Iowa, and the Virginia State Department of Agriculture and Consumer Services in Warrenton, Virginia. Others have positions with non-profit agencies, such as the American Red Cross in Rockville, Maryland; the Henry M. Jackson Foundation for the Advancement of Military Medicine (with graduates located as far afield as the United States Government HIV/AIDS Program in Uganda); and, with the Scripps Research Institute in La Jolla, California.

Several USU graduates hold appointments as civilians with DoD clinical and research organizations, including the Walter Reed Army Medical Center (WRAMC); the Walter Reed Institute of Research; the United States Army Medical Research Institute of Infectious Diseases located in Frederick, Maryland; the Aberdeen Proving Ground; the Army Medical Department Center and School at Fort Sam Houston, Texas; and, other DoD facilities. Uniformed graduates of the USU Graduate Programs have a commitment to continued service in the Uniformed Services, where they often hold a variety of positions with research, research management, teaching, or clinical responsibilities. A few hold educational positions in military establishments. Graduates of both the Pharmacology and Neuroscience Graduate Education Programs have held academic positions in the United States Army Nurse Anesthesia Training Programs at WRAMC; San Antonio, Texas; and, Hawaii. More than 90 percent of the graduates of the Master of Public Health Program (a program that largely accepts uniformed applicants) return to their individual Services and continue to hold public health related positions.

A number of USU Ph.D. graduates have entered medical school. Some are still in training, with two or three currently holding internships at various hospitals. A few are already in career positions. A Pathology Ph.D. graduate, trained in medicine at Johns Hopkins, is now the Chief of Neurosurgery at the William Beaumont Army Medical Center located in El Paso, Texas. And, a Microbiology graduate is now a pediatrician at the Greater Dundalk Medical Center in Baltimore, Maryland.

A fairly high percentage of USU graduates have moved from post-doctoral appointments to academic positions; 43 percent of the Microbiology and Immunology Graduate Education Program graduates and 16 percent of Medical Psychology Graduate Education Program graduates hold appointments in academic departments at the level of research associate or higher, with many in tenure track positions. Graduates from the Clinical Psychology, Pathology and Pharmacology Graduate Education Programs also hold appointments in the professorial track. These academic appointments are held at well recognized institutions, including the Johns Hopkins University School of Medicine, the University of Maryland School of Medicine, the Yale University School of Medicine, the Albert Einstein School of Medicine in New York, the Mahindol University in Bangkok, as well as USU. Most of the academic appointments are in medical schools, but USU graduates are also represented on non-medical faculties such as the Department of Psychology at Ohio University, the Department of Zoology at Louisiana State University, and the Department of Biological Sciences at California State University located in Sacramento, California. And, a Microbiology graduate holds an assistant professorship at the Northwestern School of Law, at the Lewis and Clark College located in Portland, Oregon.

A smaller, but not insignificant, percentage of USU Graduate Program alumni have taken up positions with research organizations in the private sector of the economy, usually after having first completed at least one post-doctoral position in an academic department. Alumni of the Pharmacology and the Pathology Graduate Education Programs hold research positions at Abbott Laboratories; and, alumni of the Microbiology Graduate Education Program hold positions with the Pharmacia Corporation located in Kalamazoo, Michigan, and with SunModics, Inc., located in Eden Prairie, Minnesota. A Biochemistry Graduate Education Program graduate holds a position with Curragen, a biotech company; and, a Pharmacology Graduate Education Program graduate has just left a major drug company to join an, as yet unnamed, start-up drug development biotech company. A few graduates have taken up positions outside of their areas of initial training. A Neuroscience Graduate Education Program graduate is a Master Control Operator in Ontario, California, for a national radio station group; a Microbiology Graduate Education Program graduate is a partner in a law firm; and, a Biochemistry Graduate Education Program graduate is a consultant with Booz-Allen Hamilton, Inc., a law firm. A few graduates have indicated that they are self-employed or working in their homes.

While the USU Graduate Education Program Directors do not have complete statistics on the careers of their graduates, the brief survey described above suggests that alumni of the USU Graduate Programs are reasonably successful at obtaining and advancing in career level positions in their chosen disciplines. Since USU is a DoD institution, and part of its mission is to advance uniformed medicine through research, it is particularly gratifying to note that a sizeable number of USU Graduate Program alumni hold career level appointments in DoD research, clinical, and educational agencies. Furthermore, a sizeable group of other graduates occupy responsible positions in other Federal government agencies concerned with the general maintenance of the Nation's health. The career successes of alumni of the USU Graduate Education Programs in public service and the Uniformed Services indicate that the University is moving forward in its goal of becoming a national health university dedicated to government service.

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Selected Achievements of USU Graduate Degree Program Alumni.

Class of 1984.

Doctor Diane Reddy, Vice Chair, Department of Psychology, University of Wisconsin, Milwaukee, USU Graduate Program Class of 1984, received her Doctoral Degree in Medical and Clinical Psychology from USU in 1984; she has been recognized for her position as Department Vice Chair at the University of Wisconsin.

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Class of 1986.

Doctor Raymond Fleming, Chair, Department of Psychology, University of Wisconsin, Milwaukee, USU Graduate Program Class of 1986, received his Doctoral Degree in Medical and Clinical Psychology from USU in 1986; he has been recognized for his position as a Department Chair at the University of Wisconsin.

James Remenick, J.D., Ph.D., Partner, Law Firm of Powell Goldstein L.L.P., Washington, D.C., USU Graduate Program Class of 1986, received his Doctoral Degree in Microbiology and Cell Biology from USU in 1986. On January 11, 2005, the Law Firm of Powell Goldstein L.L.P. announced the expansion of its Intellectual Property (IP) and Biotechnology practice with the addition of James Remenick, Ph.D., as a partner in the firm's Washington office... ***Jim is a recognized leader in the IP legal community and will significantly enhance our IP efforts in Washington, particularly in the biotechnology area. Dr. Remenick's practice involves all aspects of intellectual property protection and enforcement including litigation, prosecution, licensing, opinions, consulting and counseling. His clients have included companies ranging in size from start-ups to multinational corporations, as well as research institutions, universities and investment houses. His work has included fields as wide-ranging as drug development, immunology, genomics, diagnostics, plant pharmaceuticals, organics recycling and energy conservation, to name a few. Dr. Remenick also has significant experience in trademark and copyright protection and enforcement and will be looking to further expand both areas for the Firm. In conjunction with his work as an attorney, Dr. Remenick was a member of the U.S. Defense Science Board subcommittee on the Defense Against Biological Attacks. After the 2002 anthrax attacks on the U.S. Capitol, Dr. Remenick served as an advisor in a subsequent investigation. Dr. Remenick also serves as a consultant to the intellectual property committee of The Henry M. Jackson Foundation for the Advancement of Military Medicine, and obtained a security clearance from the U.S. Department of Defense to work on classified matters. Dr. Remenick received his Ph.D. from the Department of Microbiology of the Uniformed Services University of the Health Sciences, and spent four years as a medical researcher and an American Cancer Society post-doctoral fellow at the Laboratory of Molecular Virology of the National Cancer Institute at the National Institutes of Health.***

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Class of 1988.

Kevin Tonat, Dr.Ph., USU Graduate Program Class of 1988, who received his Master of Public Health Degree from USU, retired from the United States Public Health Service and now serves as the Executive Science Officer for Cosmos Alliance Management, based in Washington, D.C.

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Class of 1990.

Lawrence Sung, Ph.D., J.D., USU Graduate Program Class of 1990, who received his Doctoral Degree in Microbiology and Cell Biology from USU, is currently serving as a lawyer with the Washington, D.C. based firm of Preston Gates & Ellis, L.L.P. Doctor Sung specializes in intellectual property litigation, life sciences, patents, technology and intellectual property, and technology transfer and commercialization.

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Class of 1991.

Taras Masnyk, M.D., Ph.D., USU Graduate Program Class of 1991, who received his Doctor of Philosophy Degree in Pathology from USU, left the Army where he served as the Chief of Neurosurgery at the William Beaumont Army Medical Center in El Paso, Texas, and returned to Illinois for civilian practice.

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Class of 1993.

Gerard P. Andrews, Ph.D., USU Graduate Program Class of 1993, who received his Doctoral Degree in Microbiology and Cell Biology from USU, left the Army and is now serving as the Task Area Director for Product Development in the Bacteriology Division of the United States Army Medical Research Institute of Infectious Diseases (USAMRIID) at Fort Detrick, Maryland.

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Class of 1994.

Commander Margaret A. K. Ryan, MC, USN, MPH, Director, DoD Center for Deployment Health Research, Naval Health Research Center, San Diego, California, USU Graduate Program Class of 1994, who received a Master of Public Health Degree from USU, heads a team at the Naval

Health Research Center that has worked on several initiatives to support, directly or indirectly, those uniformed personnel deployed to Operation Iraqi Freedom. Those initiatives include: equipping Naval Environmental Preventive Medicine Unit 5 and several ships (now forward deployed) to better detect and rapidly diagnose pathogens causing respiratory illness in service members; assisting with the development of augmented post-deployment health assessments, as required by the Office of the Assistant Secretary of Defense, Health Affairs; partnering with the Centers for Disease Control (CDC) to address health concerns related to smallpox and anthrax vaccinations; and, standing ready to expeditiously assess the epidemiology of post-deployment health concerns, as required.

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Class of 1995.

CAPT Maura Emerson, MPH, MC, USN, Force Medical Officer, Military Sealift Command, Washington Navy Yard, USU Graduate Program Class of 1995, who received a Master of Public Health Degree from USU, is responsible for smallpox and other immunization tracking programs for all of the military and civilian contractors in the Military Sealift Command. CAPT Emerson also received her M.D. Degree from USU in 1988.

Tina McIntyre, Ph.D., USU Graduate Program Class of 1995, who received a Doctoral Degree in Pathology, is now the Administrator for the Inflammation and Innate Immunity Study Section and Immunity and Host Defense Study Section at the Center for Scientific Review, National Institutes of Health, in Bethesda, Maryland.

CAPT H. Jeffrey Yund, USN, USU Graduate Program Class of 1995, who received a Master of Public Health Degree from USU, is the Preventive Medicine Officer at the Headquarters of the Marine Corps where he serves as the Principal Advisor for Deployment Health Surveillance and the Smallpox and Anthrax Immunization Programs. CAPT Yund recently stepped down as the Chair of the Joint Preventive Medicine Policy Group.

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Class of 1996.

Lieutenant Colonel Jeffrey Adamovicz, USAF, Ph.D., USU Graduate Program Class of 1996, who received a Doctoral Degree in Microbiology and Cell Biology from USU, serves as the Chief of the Bacteriology Division of the United States Army Medical Research Institute of Infectious Diseases at Fort Detrick, Maryland.

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Class of 1997.

James (Jay) Phillips, Ph.D., USU Graduate Program Class of 1997, who received a Doctoral Degree in Pharmacology at USU, is now the Health Sciences Grants Manager for the Congressionally Directed Medical Research Programs at Fort Detrick in Frederick, Maryland.

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Class of 1998.

Lieutenant Colonel Mark Arness, USAF, USU Graduate Program Class of 1998, who received a Master of Tropical Medicine & Hygiene Degree from USU, is serving as an Air Force Preventive Medicine Officer at the Army Medical Surveillance Activity and Defense Medical Surveillance System, where he is responsible for post-deployment health surveillance and is involved in adverse event surveillance following vaccination.

CAPT Ken Schor, USN, USU Graduate Program Class of 1998, who received a Master of Public Health Degree from USU, is the Preventive Medicine Officer at the Bureau of Medicine and Surgery (BUMED) where he serves as the Principal Advisor to the Surgeon General for Deployment Health Surveillance and the Smallpox and Anthrax Immunization Programs.

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Class of 1999.

CAPT Ed Kilbane, USN, USU Graduate Program Class of 1999, who received a Master of Public Health Degree from USU, is a team leader of the forward deployed Naval Environmental Preventive Medicine Unit (NEPMU-7) in a classified operational location.

Steven Berkowitz, Ph.D., USU Graduate Program Class of 1999, who received a Doctoral Degree in the Clinical Psychology Program from USU, moved from the Veterans Administration Cooperative Studies Program to become the Director of the Division of Operations and Committee Support, Coverage and Analysis Group, Center for Medical and Medicaid Services located at the headquarters in Baltimore, Maryland. Doctor Berkowitz is involved in the scientific evaluation of the evidence base for Medicare's National Coverage Decisions.

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Class of 2000.

Lieutenant Commander Tanis Batsel, USN, USU Graduate Program Class of 2000, who received a Master of Public Health Degree from USU, is assigned as the Chief of the Preventive Medicine Branch for the United States Northern Command and the North American Aerospace Defense Command (NORAD) at Peterson Air Force Base, Colorado. Doctor Batsel also graduated from the USU SOM in 1993.

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Class of 2001.

Major Philip L. Gould, MPH, DTMH, USAF, MC, Preventive Medicine Consultant, Deployment Health Surveillance/Suicide Surveillance, Epidemiology Services Branch, Air Force Institute for Environmental Safety and Occupational Health Risk Assessment, Brooks City-Base, Texas, USU Graduate Program Class of 2001, who received a Master of Tropical Medicine and Hygiene Degree from USU, is assigned with deployment surveillance for all of the Central Command (CENTCOM) and assisting command units at the Air Force Institute for Environmental Safety and Occupational Health Risk Assessment (AFIERA). Personnel at AFIERA are at the forefront of surveillance for currently deployed troops, with responsibilities to provide routine briefs and reports for: the Secretary of Defense; the Assistant Secretary of Defense, Health Affairs; and, the Joint Chiefs of Staff.

Major Mylene Huynh, USAF, USU Graduate Class of 2001, who received a Master of Public Health Degree from USU, is assigned as the Deputy Chief of Preventive Medicine at the Office of the Surgeon General of the Air Force, where she serves as an advisor for Deployment Health Surveillance and the Smallpox and Anthrax Immunization Programs.

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Class of 2002.

Commander Byron Conner, USN, USU Graduate Program Class of 2002, who received a Master of Public Health Degree from USU, is a member of the forward deployed Naval Environmental Preventive Medicine Unit (NEPMU-2) in a classified operational location.

Lieutenant Commander Charles McCannon, MC, USN, USU Graduate Program Class of 2002, who received a Master of Public Health Degree from USU, passed the Certified MBA Examination and was awarded the CMBA Designation by the International Certification Institute. He was among the first group of MBAs to earn the distinction.

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Class of 2003.

Captain Colleen Daniels, USA, USU Graduate Program Class of 2003, who received a Master of Public Health Degree at USU, was awarded the Myra McDaniel Writers Award for her paper on an ergonomics-based approach to preventing musculoskeletal disorders in the Army. This competitive award is given to the entry judged best on the basis of its pertinence to occupational therapy practice, education, research or administration, originality, style and clarity of communication, and scholarship. The winner is selected by the Chief of the Occupational Therapist Section, Office of the Army Surgeon General. Daniels was the first graduate of the Occupational Ergonomics track in the MPH program and currently is at the United States Army Center for Health Promotion and Preventive Medicine.

Commander Gary Hook, USN, USU Graduate Program Class of 2003, who received a Doctoral Degree in Environmental Health Sciences, Department of Preventive Medicine and Biometrics Program, USU, currently serves as an Assistant Professor in the Division of Environmental and Occupational Health at USU. Among his duties, he is a mentor to graduate students in the Preventive Medicine Programs.

Lieutenant Commander Gregory Langham, USPHS, USU Graduate Program Class of 2003, who received a Master of Public Health Degree at USU, is the Senior Staff Veterinarian, Animal Resources Branch, Scientific Resources Program, National Center for Infectious Diseases of the Centers for Disease Control and Prevention in Atlanta, Georgia.

Niloufar Neely Kazerouni, USU Graduate Program Class of 2003, who received a Doctoral Degree in Public Health (Dr.PH) from USU, went to the Centers for Disease Control and Prevention (CDC), National Center for Environmental Health Air Pollution and Respiratory Health Branch, located in Atlanta, Georgia. She serves as an Epidemiologist assigned to several states and is the project officer for a study on *The Role of Respiratory Viral Infections in Exacerbations of Asthma*.

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Class of 2004.

Joshua Murtie, USU Graduate Program Class of 2004, who received a Doctor of Philosophy Degree in Molecular and Cell Biology at USU, received the 2004 Graduate Student Award at the USU Commencement Ceremonies. He is currently a Post-Doctoral Fellow in the Department of Neurology at Childrens Hospital in Boston, Massachusetts.

Lisa May, USU Graduate Program Class of 2004, who received a Doctoral Degree in Public Health from USU, serves as the Director of the Office of Emergency Preparedness and Response, Maryland Department of Health and Mental Hygiene. She is responsible for coordinating the *All Hazards* (snow, hurricanes, and biological/chemical/nuclear hazards) approach to emergency management and response in the Department of Health and Mental Hygiene (DHMH).

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V. GRADUATE MEDICAL EDUCATION

Army Graduate Medical Education (GME) Programs are the keystones to the quality of Army Medicine. Our GME Programs include military-unique aspects of a given specialty, which prepare physicians for the rigorous demands of practice in a wartime or contingency environment. Residents receive orientations and lectures concerning war zone injuries, trauma, and military deployments. Additionally, they attend formal training which includes a centralized combat casualty care course, advanced trauma life support, and medical management of chemical and biological casualties. After completing an Army Graduate Medical Education Program, a physician is uniquely qualified to deploy at all levels within the theater of operations to support the military medical mission. We now place board-certified physicians in our brigade and division surgeon positions to ensure that our divisional soldiers receive the highest levels of care regardless of where they are in the world.

- **Lieutenant General James B. Peake, the Surgeon General of the Army**, Testimony before the House Committee on Armed Services, Subcommittee on Defense, April 10, 2002.

ESTABLISHMENT

Background - Graduate Medical Education Programs in the Military Health System. Graduate medical education (GME) comprises the second phase of the formal educational process that prepares physicians for medical practice. GME is required of all medical school graduates seeking full medical licensure and board certification in one of the specialties and/or subspecialties of medicine. This phase of medical education is, of necessity, conducted primarily in clinical settings, and requires direct participation by residents in the delivery of patient care services. Conducting high quality GME has always been a demanding undertaking. Ensuring an optimal learning environment and creating a proper balance between education and patient care activities have been the principal challenges to medical educators. In recent years, those challenges have become increasingly formidable due to the impact that the tremendous changes in the health care delivery system have had on the patient care environments in which GME is conducted. Certain of these changes have presented particularly difficult challenges for GME. Of special note, the shortened length of hospital stays, the increased emphasis on ambulatory care, the reductions in support staff, and the increased acuity of the average in-patient have placed increased demands on residency programs across the United States. The military GME programs in the National Capital Area have addressed many of these concerns through the use of simulated patients and virtual clinical experiences as discussed later in this section.

Following their graduation from the USU School of Medicine (SOM), the USU physician-graduates become active duty officers in the Military Health System (MHS) and are assigned to serve as residents in the MHS Graduate Medical Education Programs. The length of time served as a resident depends upon the individual specialty area. Residents in the MHS enjoy unique educational advantages. For example, the uniformed faculty members at the military teaching hospitals are all full-time, ensuring a level of involvement in student and resident (GME) education that is unmatched at other settings. The military GME system is second in size only to that of the Department of Veterans Affairs; and, it is committed to

medical education at all levels over a broad range of disciplines. The National Capital Consortium (NCC) residents, as well as all other residents in the integrated GME programs throughout the Military Health System, significantly benefit from the dedicated uniformed faculty and staff who provide educational GME programs and training at the military medical centers. And, as mentioned above, the NCC resident also has the advantage of participating in state-of-the-art simulated education and training.

The military resident, in most programs, also serves as an educator or trainer of medical students and junior residents. This proves to be a unique growth opportunity; and, most often, the resident comes to understand that teaching is actually an advanced expression of learning. Preparation for student lectures and teaching rounds is a reiterative process, which consolidates the resident's own base of medical knowledge. The USU medical students and the more junior NCC residents are the indirect beneficiaries of the senior residents' training as they observe and participate in conferences, activities and clinics directed toward their education.

Simulated Operating Rooms for Specific Specialties Are Available on the USU Campus. Advanced training is provided by the USU Clinical Simulator and Patient Simulation Laboratory (PSL), which is fully equipped with all of the functional equipment of an operating room, to include standard monitoring equipment, a life support system (anesthesia machine and ventilator), a defibrillator, and instruments used in treatment. The PSL also includes complete audio/video recording and playback equipment. Training sessions are recorded; and, immediately following, the residents review their performance with their instructors. The simulated patient provides a unique opportunity to experience relatively rare cases, military relevant, and combat trauma scenarios. The residents gain experience in recognizing problems, developing decision-making skills, familiarizing themselves with instruments and equipment, and refining techniques and procedures. Residents are able to repeat the scenarios until they are performed correctly. ***Residents from the NCC GME Anesthesiology Program, receive approximately 100 hours of intensive, hands-on annual training***. The PSL also trains uniformed participants in the NCC GME Pediatrics Resident Program. Scenarios are designed to present specific patients who provide complex clinical problems; thus, critical experience is acquired without putting human patients, or the residents, at risk.

The National Capital Area Medical Simulation Center Offers State-of-the-Art Simulated Training. Following collaborative efforts that began in 1995, USU and the Surgeons General of the Army, Navy and Air Force instituted a new teaching facility, the National Capital Area Medical Simulation Center (SIMCEN), in support of numerous and distinct medical education programs. The SIMCEN, a satellite facility located in Silver Spring, Maryland, began initial operations in the Fall of 1999, and remains one of the few places in the United States that combines multi-simulation techniques under one roof. This nationally-recognized, state-of-the-art teaching facility allows health professionals to augment their skills through patient simulations, virtual reality applications, and training with mannequin simulators. It uses technology and actors posing as patients to teach the NCC GME residents about situations that they may encounter as practitioners but might not otherwise experience while training in hospital wards. The SIMCEN also provides the instruction of readiness skills and focused pre-deployment training for wartime, peacekeeping, and humanitarian missions. ***During 2004, the SIMCEN supported over 21 GME educational activities for approximately 600 uniformed officers*** (the SIMCEN is described at length in Section I of this report).

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The USU School of Medicine Office of Graduate Medical Education (GME). The USU SOM Office of Graduate Medical Education was established in 1986 to provide consultation on GME programs (internship, residency, and fellowship training for physicians) for Program Directors and the Office of the Assistant Secretary of Defense for Health Affairs (OASD/HA). From 1986 to present, USU GME, under the leadership of the Associate Dean for Graduate Medical Education, has provided DoD-wide consultation and oversight for numerous GME programs.

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MISSION

USU Office of GME Serves as a Significant Academic Component for Graduate Medical Education in the Military Health System. The University is directed to educate and train competent medical personnel qualified to serve the needs of the MHS through the provision of quality education programs in the health sciences. The Graduate Medical Education Programs of the MHS are of critical importance to both the University and to the entire network of Military Treatment Facilities. In light of this, the USU SOM Office of Graduate Medical Education serves as a significant academic component in the development of the medical expertise of the MHS residents in their assignments throughout the military GME programs. The following responsibilities are currently assigned to the USU GME program: 1) oversight for the National Capital Consortium; the USU SOM Associate Dean for Graduate Medical Education serves as the NCC Administrative Director; 2) collection and evaluation of data on the DoD GME programs to ensure academic and scientific excellence; 3) oversight for the integration of the DoD GME programs to ensure that accreditation is not jeopardized; and, 4) provision of consultation and advice for the Dean, School of Medicine, the President, USU, and others on military-unique medical curricula.

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POLICY FOR MILITARY UNIQUE TRAINING IN DOD-SPONSORED GRADUATE MEDICAL EDUCATION PROGRAMS

The USUHS shall coordinate efforts of the Services in developing the necessary curricula (for military unique training in DoD-sponsored Graduate Medical Education Programs) and shall establish a centralized repository of information on educational materials and courses to support the implementation of the curricula.

- Policy Memorandum, Office of the Assistant Secretary of Defense, Health Affairs, dated June 28, 1999, page one.

Graduate Medical Education Policy Is Issued by the Assistant Secretary of Defense for Health Affairs on June 28, 1999. In a memorandum dated June 28, 1999, the Assistant Secretary of Defense for Health Affairs (ASD/HA) stated that the Graduate Medical Education (GME) Programs conducted for military trainees in DoD facilities offer an opportunity to include military unique aspects to prepare physicians for the rigorous demands of practice in a wartime or contingency environment. The memorandum pointed out that it is essential for the military medical services to avail themselves of the opportunity in a comprehensive, yet efficient, manner; and, that new policies relative to DoD-sponsored GME programs are being established.

Each Program Must Include a Military Unique Curriculum that Is Standardized and Specialty Specific.

USUHS was the catalyst from which my entire career has evolved. Today, more than ever, this catalyst is necessary if we are to train and retain military physicians who place enormous value on the unique art and science of a military medical profession. We must have a cadre of military medical officers who practice the art and science of military medicine with an understanding of the past, where we have come from, applying new capabilities and skills within the context of military operations and be able to envision and work toward a more capable, flexible and agile military medical system in the future.

- **Brigadier General C. William Fox, Jr., MC, USA, USU SOM Class of 1981, Commanding General, Brooke Army Medical Center, Great Plains Regional Medical Command,** Fort Sam Houston, Texas, Correspondence with USU, April 13, 2005.

The GME Policy Memorandum of June 28, 1999, specified that at the entry level, each GME program must incorporate a standardized curriculum, which includes a core of those topics essential to every physician who will practice medicine in the military. This curriculum should be augmented by an orientation to field medicine such as the Combat Casualty Care Course (C4) or equivalent experience. The curriculum should be designed to complement, not replace, military training obtained through other means and only those elements that are both necessary and appropriate to the GME education program should be included. Beyond the entry year, each program should also include a military unique curriculum that is

standardized and specialty specific. For subspecialty training, the curriculum may be directed toward the projected utilization of the trainee, usually in his/her core specialty. An appropriate exposure to the practice of the specialty in an austere or contingent environment should be an essential element of each program.

USU School of Medicine Office of Graduate Medical Education Coordinates the Development of Curricula.

> **I became a surgeon and then specialist in Urology but always viewed my surgical expertise from the perspective of how I would apply my board certified skills within the context of the battlefield application of echeloned health care. My determination and experience, which began as a medical student, were the fundamental building blocks necessary to establish this as a vital aspect of my profession as a military surgeon and not a surgeon in the military. Through the crucible of war and peace, I have consistently applied my experience as an Army officer, surgeon, leader, and commander to optimize the delivery of health care on the battlefield.**
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> - **Brigadier General C. William Fox, Jr., MC, USA, USU SOM Class of 1981, Commanding General, Brooke Army Medical Center, Great Plains Regional Medical Command,** Fort Sam Houston, Texas, Correspondence with USU, April 13, 2005.

The USU School of Medicine Office of Graduate Medical Education was tasked by the Assistant Secretary of Defense for Health Affairs to coordinate the efforts of the Services in developing the necessary curricula and to establish a centralized repository of information on educational materials and courses to support the implementation of a military unique curriculum, which is both standardized and specialty specific.

The policy memorandum also directs that military unique training in GME programs must be documented on an annual basis and reported to the ASD(HA) by the Services by September 30 of the completed training year. Each program review must confirm that a military unique curriculum is in place and that it is being utilized; it should also confirm that appropriate opportunities to experience specialty practice in constrained environments exist and are being utilized.

Following the receipt of the June 28, 1999 GME Policy Memorandum, the military unique curriculum for each major specialty was developed and posted on the Graduate Medical Education Web Site <*http://cim.usuhs.mil/dodgme/*>. Subject matter expert panels have been reconstituted to accomplish biennial revisions; however, continued funding is critical to ensure the future of the project.

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NATIONAL CAPITAL CONSORTIUM

Development of the National Capital Consortium. In 1993, the Assistant Secretary of Defense for Health Affairs directed that duplicative GME programs in the National Capital Area and San Antonio must be integrated or closed. This led to the establishment, in January of 1995, of the National Capital Military Medicine Education Consortium consisting of the Walter Reed Army Medical Center (and its subordinate command, the Dewitt Army Hospital located at Fort Belvoir, Virginia), the National Naval Medical Center, the Malcolm Grow Medical Center, and the USU School of Medicine. At that time, there were 86 programs located at five sites.

Ten GME programs were integrated into five during the first year of the Consortium's existence. In 1997, the Consortium was site surveyed by the Accreditation Council for Graduate Medical Education (ACGME) and given a *favorable decision* by the ACGME as an institutional sponsor. Later that year, the administrative headquarters was relocated to USU and **Howard E. Fauver, Jr., M.D., Associate Dean for Graduate Medical Education, became the Administrative Director**. The name was changed to the National Capital Consortium (NCC) in 1997, as well. Growth of the NCC continued sporadically over the next few years; and, it was not until 2002, that the last of the GME programs in the National Capital Area came under the sponsorship of the NCC, bringing the current total to 65 programs. The NCC was again approved by the ACGME as an institutional sponsor, in 2001, for the maximum five-year period.

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Mission of the National Capital Consortium. The National Capital Consortium (NCC) serves as the institutional sponsor for the GME integrated programs offered by the three major Medical Treatment Facilities (MTFs) in the National Capital Region: the Walter Reed Army Medical Center; the National Naval Medical Center; and, the Malcolm Grow Medical Center. The three MTFs comprise the NCC membership; and, the USUHS SOM serves as the fourth, and final, member of the NCC. The USU Office of GME also serves as the Administrative Office for the NCC.

The mission of the NCC is to educate physicians, dentists, and other health care professionals who provide care for the soldiers, sailors, airmen, and marines of all ages, throughout the Military Health System, to include their families. The NCC provides a scholarly environment and is dedicated to: excellence in both education and health care; and, the provision of ethical values and standards to all trainees, such as would be expected of those who devote their lives to careers in public service. Information about the NCC programs, governance, Bylaws, and NCC Administrative Handbook can be accessed via the NCC web site: <*http://www.usuhs/mil/gme*>.

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Accreditation. The Accreditation Council for Graduate Medical Education (ACGME) is responsible for the accreditation of post-medical doctorate (M.D.) physician training programs within the United States. Accreditation is accomplished through a peer review process and is based upon established standards and guidelines. ***The mission of the ACGME is to improve the quality of health care in the United States by ensuring and improving the quality of graduate medical education experiences for physicians in training.*** The ACGME established national standards for graduate medical education by which it approves and continually assesses education programs under its aegis. It uses the most effective methods available to

evaluate the quality of graduate medical education programs; and, it strives to improve evaluation methods and processes so that they are valid, fair, open, and ethical. In carrying out these activities, the ACGME is responsive to change and innovation in education and current practice; it promotes the use of effective measurement tools to assess resident physician competency; and, it encourages educational improvement.

The National Capital Consortium (NCC), by supplying leadership and resources, complies with the ACGME Institutional Requirements and ensures that Consortium-sponsored programs comply with ACGME program requirements. Consortium-sponsored programs comply with ACGME program requirements; and, an increasing number of full five-year accreditations are being attained. Consortium-sponsored GME programs operate under the authority and control of the Consortium (NCC). The Consortium regularly assesses the quality of the NCC educational programs. Despite the impact of the war in Iraq, the education mission continues to be met through the dedication and hard work of those who have not been deployed and remain in the NCC programs.

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A Selected Example of GME and GME Staff Contributions to DoD Mission Requirements.

The Army's Regional Anesthesia Pain Management Initiative. The Army's Regional Anesthesia Pain Management Initiative was established, in 2000, by **Colonel Jack Chiles, MC, USA, Associate Professor, USU SOM Department of Anesthesia,** and **Lieutenant Colonel Chester C. Buckenmaier III, USU SOM Class of 1992, Chief, Regional Anesthesia Section, Walter Reed Army Medical Center**. Both Doctors Chiles and Buckenmaier have performed the procedure, technically known as a continuous peripheral nerve block, at the 31st Combat Support Hospitals in Baghdad and Balad. They were looking for ways to improve battlefield pain control and identifying an anesthetic that would reduce the logistics footprint. Regional anesthesia has many qualities that make it an ideal battlefield anesthetic. It does not require a lot of equipment; and, it allows patients to maintain their sensorium. Regional anesthesia, even with a single injection, lasts a long time; wherever a needle is placed, the surgeon can use a paraneural catheter that will allow continuous access so that infusions of local anesthetic can be run for days to control pain. Recent Congressional funding has allowed research and the academics required to bring this initiative forward for peer review.

Doctors at the Walter Reed Army Medical Center have been using regional anesthesia since 2000; however, ***October 7, 2003 was the first time that it was used on the battlefield.*** LTC Buckenmaier performed the procedure while on a forward surgical team with the 31st Combat Support Hospital, in Balad. The first definitive surgery wounded soldiers receive is at a combat support hospital; and, that is where anesthesiologists work and where regional anesthesia techniques are used. The Army Surgeon General was concerned about wounded soldiers being flown from the battlefield in excruciating pain; thus, he directed that regional anesthesia be used. Using regional anesthesia, physicians do not have to bring the patient to the operating room to complete a dressing change; with the regional anesthesia block inserted, the doctor can dose the catheter and complete a dressing change right at the bedside.

Doctors at George Washington University Medical Center, in Washington, D.C., had been performing regional anesthesia and providing regional anesthesia for a long time, but they had not used continuous peripheral nerve blocks. The attending anesthesiologist at George Washington's Regional Anesthesia Center, Doctor Olya Quitkin, recognized that the Walter Reed Medical Center already had an established service that worked well; she decided to visit at Walter Reed and determine how they could

establish a similar initiative at George Washington. Doctor Quitkin attended a workshop conducted by LTC Buckenmaier in 2003; she has already put to use a lot of what she learned during that workshop. Doctor Quitkin recognized that using continuous peripheral anesthesia blocks would save time and money and greatly reduce pain.

LTC Buckenmaier would like to see the Army's Regional Anesthesia Pain Management Initiative expanded to include the other Services. ***He started a Fellowship Program in July of 2004***, which is directed by **Major Scott Croll, USU SOM Class of 1995**. The first Fellow to participate in the program is **Lieutenant Colonel Cynthia Shields, USU SOM Class of 1989**. The Air Force has indicated a strong interest in the program.

(This section was based on an article in USU Medicine, *Bringing Wounded Troops Home*, Summer 2004 Edition, pages 6-15.)

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NCC/GME Awards and Distinctions (2003-2004).

As in previous years, the Residents, Fellows and Faculty in the NCC GME Education Programs garnered numerous distinctions and awards. The following are selected examples:

- **Lieutenant Colonel Michael Nelson, MC, USA, Diagnostic Immunology Program Director,** and **Colonel Philip Corcoran, MC, USA, Cardiothoracic Surgery Program Director,** received the prestigious ***LTG Claire L. Chennault Award*** as outstanding teachers; **COL Corcoran** also received the ***Army Surgeon's General A Designator***;

- **Seven Residents of the NCC Dermatology Program had their presentations accepted** at the ***American Academy of Dermatology Annual Meeting***;

- **Captain Joshua Sparling, MC, USA, Resident, Dermatology Program,** was selected to serve as the ***Resident Representative on the Dermatology Residency Review Committee***;

- **Major Anthony Beutler, Malcolm Grow Family Medicine Program, current NCC WRAMC Transitional Year Program Director,** received a **4 million dollar NIH grant** to study ***Epidemiology of Jump-Landing Movements and ACL Injury***;

- **The NCC WRAMC Internal Medicine Program Faculty**, had ***eight peer-reviewed publications and three abstracts selected for poster presentations***, out of several thousand submissions nation-wide, at the ***National American College of Physicians Annual Meeting***;

- There were ***13 abstracts presented by NCC Residents*** at the ***National American College of Physicians Annual Meeting***; among them were ***four prize winners***;

- **CAPT Muhamed Shakir, MC, USN, Endocrinology Program Director,** was awarded *the title of* ***Master of the American College of Physicians, the highest award given by that organization***;

- **Doctor Michael Zapor, Internal Medicine Fellow,** received a travel award for his presentation at a meeting of the ***Infectious Disease Society of America***;

- **Captain Bucci, MC, USA, a Nephrology Fellow,** was an ***NKF Fellows' Forum Award winner***;

- **Lieutenant Colonel Mark DiFazio, MC, USA, a Child Neurology Staff Member,** has emerged as a ***national expert in the use of botulinum toxin in the treatment of motor disorders*** and spoke at numerous meetings during the past year;

- **Lieutenant Colonel Rocco Armanda, MC, USA, Neurosurgery Faculty Member, *received a Bronze Star for his service in Iraq***;

- **Colonel Andrew Satin, USAF, MC, Former Residency Program Director, Current Department Chair of Obstetrics and Gynecology at USUHS, *was appointed to the Residency Review Committee in Obstetrics and Gynecology***;

- **Major Jason Parker, Reproductive Endocrinology and Fertility Fellow,** received the ***Founders' Award of the Armed Forces District for Best Paper***; the Fellows also had 15 abstracts accepted, an 83 percent acceptance rate;

- **Lieutenant Colonel Eiseman, MC, USA, Ophthalmology Program Director, *is an Examiner for the Board of Ophthalmology***;

- **NCC WRAMC Orthopaedic Residents won six outstanding or first place awards, in addition to, *the Resident Leadership Award***;

- **Colonel Martin Ottolini, USAF, MC, Pediatric Infectious Disease Program Director, was *named to the Society of Pediatric Research***;

- **The Residents and Staff in Physical Medicine and Rehabilitation *received an Outstanding Achievement Award from the Academy of Physical Medicine and Rehabilitation in recognition for their work caring for the wounded in Operations Enduring Freedom and Iraqi Freedom***; and,

- **Colonel Cathy Nace, MC, USA, Transitional Year Program Director at Walter Reed, Chair of the Council of Transitional Year Program Directors,** was recently ***selected to serve on the Accreditation Council for Graduate Medical Education (ACGME) Transitional Residency Review Committee***.

Scholarly Activity.

The ***NCC Faculty, Residents, and Fellows*** continue to produce large numbers of articles, book chapters, poster presentations and abstracts, including major articles in such prestigious publications as the New England Journal of Medicine.

Board Certification.

Board certification rates continue to be high, approaching 100 percent in a majority of the NCC Program Specialties.

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VI. THE OFFICE OF CONTINUING EDUCATION FOR HEALTH PROFESSIONALS

Continuing Health Professional Education responds to the needs for professional development for military health care professionals around the world. All uniformed practitioners are required to receive continuing education, and have a choice from civilian, military, and USU sources. USU offers a unique blend of the military application as well as collaborative expertise that is able to pull from all of the armed services branches - Army, Navy, Air Force - through the leadership of the USU. Those military members seeking professional development through a single armed service would typically be limited to information for their branch. The USU is uniquely accredited (i.e., **Accreditation Council on Continuing Medical Education, American Psychological Association, and American Nurses Credentialing Center's Commission on Accreditation) to address all aspects of health care education across all branches of the military... The Team suggests the USU investigate ways to further promote this unique opportunity to provide continuing education to all branches of the military.**

- **Educational Program and Curricula**, Continuing Health Professional Education, Report to the Faculty, Administration, Trustee, Students of USU, Middle States Commission on Higher Education, prepared for the 2003 site visit, page 11.

MISSION

USU is Mandated by Congress to Provide Continuing Education for Health Professionals. Under Title 10, U.S. Code (Section 2113), USU is mandated by Congress to "establish programs in continuing medical education for military members of the health professions to the end that high standards of health care may be maintained within the military medical services." The mission of the USU Office of Continuing Education for Health Professionals (CHE) is to sponsor, directly or jointly, activities in continuing education for members of the Federal health care delivery system ensuring achievement of the Congressional mandate. This standard of excellence is achieved through a vigorous and creative evaluation process.

The Office of **CHE plays a central role in facilitating the continued professional growth of health care professionals in the Federal Services by providing live courses and conferences, enduring materials, and web-based continuing education (CE)**. In addition, the Office of CHE establishes activities for non-Federal civilian health professionals in disciplines where the body of knowledge is available primarily within the Federal Services medical domain and when that knowledge will contribute to the health of the Nation, other countries, or the global community.

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Six Factors Mandate CHE's Essential Role in Today's Military Health System. Continuing Education has always been recognized as an essential component of the continuum of education for health professionals. Current educational, social, and political factors that highlight the critical role of CE in the educational spectrum follow:

***Enhanced awareness of proactive health care provider response to worldwide threats*;**

***Incorporation of evidence-based medicine, clinical practice guidelines, and accountability into daily medical practice*;**

***Heightened patient safety accountability*;**

***Recognized CE value for provider skill level competency for medical readiness and deployment scenarios*;**

***Increased demand to deliver cutting-edge CE and rapid advances in biomedical knowledge, clinical practice guidelines, and health care technology*;** and,

Focused partnerships between military medicine, other Federal, and private sector medicine.

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CHE Must Ensure Academic Involvement in all Phases of Educational Activities Designated for Credit. The Office of Continuing Education for Health Professionals is under the leadership of the Senior Executive Director, who reports directly to the USU President, and is responsible for administrative/ academic involvement in all phases of the educational activities designated for credit, to include:

- Needs assessment, planning, implementation, and evaluation of continuing education activities for members of the health professions serving in the Uniformed and other Federal Services. Continuing education activity topics are based on formal surveys, structured interviews, current professional topics, and higher authority directives. In every case, the particular interest, needs, and learning styles of the specific audience are considered during planning, preparation, delivery, and evaluation;

- Acquisition and maintenance of continuing education accreditation at USU; attendance at professional conferences and meetings conducted by the accrediting agencies or peer groups to ensure University compliance with all continuing education requirements of the Accreditation Council for Continuing Medical Education, the American Nurses Credentialing Center's Commission on Accreditation, the American Psychological Association, the American College of Healthcare Executives, and the State of Maryland Department of Health and Mental Hygiene Board of Social Work Examiners;

- Administrative and logistical support and determination of budgetary requirements for continuing education activities sponsored by the University;

- Maintenance of professional and educational liaisons with military and civilian professional organizations and academic institutions; and,

- Monitoring the quality of continuing education activities and using evaluative and outcome data to improve the quality of future activities at the University. Annual total program evaluations identify areas where improvement could enhance the continuing education services provided by the University. Mechanisms, such as the evaluation of events by participants, by faculty, and by office staff, help to improve the quality of similar forthcoming events. A consistent focus on developing employee potential through cross training within the office and additional training within the University and from outside sources also improves the provision of services. Continuous quality improvement is active in all areas of the CHE Office.

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NATIONALLY RECOGNIZED CONTINUING EDUCATION CREDIT

Unique Accreditation Within the Military Health System. The USU Office of Continuing Education for Health Professionals provides nationally recognized continuing education credit for physicians, nurses, psychologists, health care executives, and social workers through its accreditation by: 1) the Accreditation Council for Continuing Medical Education (accredited through July of 2011); 2) the American Nurses Credentialing Center's Commission on Accreditation as a Provider of Continuing Education in Nursing (accredited through August of 2007); 3) the American Psychological Association (accredited through February of 2008); 4) the American College of Healthcare Executives (ACHE) authorized USU to award pre-approved Category II (non-ACHE) continuing education credit through June 30, 2008; and, 5) the State of Maryland Department of Health and Mental Hygiene Board of Social Work Examiners (indefinitely). **This inclusive provision of continuing education for multiple disciplines, from one office, is believed to be unique within the Military Health System (MHS).**

The Office of CHE, under the academic umbrella of the University, is exceptionally positioned to perform a significant role in facilitating the continued professional growth of health care professionals in the MHS. The principal responsibilities of the office are the identification of educational needs, planning, implementation, and the evaluation of continuing education activities and outcomes.

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The Continuing Health Education Committee. The Continuing Health Education Committee (CHEC) serves as an approving body and as an advisory committee to the USU President and to the Office of CHE. The USU President appoints the CHE Committee members. Other faculty members are invited to participate in the committee activities on an *ad hoc* basis. The committee membership, across all disciplines and departments, facilitates communication and provides a forum for planning education activities and for the discussion of issues and policies that affect continuing medical education.

The CHEC has incorporated an internal evaluation system for all sponsorship requests through which individual requests are scored against a matrix representing the Accreditation Council for Continuing Medical Education Essential Areas and Elements. The CHEC has formed task forces to address critical accreditation issues, such as evidence-based CME, content validation, standards for commercial support, and outcomes evaluation. In all cases, committee members bring a wealth of experience and perspective to the CHEC as an oversight body.

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INCREASED SUPPORT FOR THE MILITARY HEALTH SYSTEM

CHE Support for Graduate Medical Education Programs. In conjunction with the National Capital Consortium (the institutional entity for the National Capital Region's GME-integrated programs offered by the Walter Reed Army Medical Center, the National Naval Medical Center, and the Malcolm Grow Medical Center), the Office of CHE's involvement has greatly increased through the sponsoring of on-going continuing medical education (CME) activities such as Regularly Scheduled Conferences (i.e., Grand Rounds) in Anesthesia, Deployment Health, Faculty Development, GYN Oncology Tumor Planning, Ophthalmology, Pediatrics, and Psychiatry.

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CHE Support for TRICARE/Health Affairs Initiatives. During Fiscal Year 2004, the USU Office of CHE supported the Office of the Secretary of Defense (OSD), Health Affairs (HA) with the following activities: Med Teams Training; the DoD Spokesperson Training Program - Anthrax/Smallpox; the DoD Suicide Prevention Conference; the TRICARE Conference; the TRICARE Composite Health Care System II Courses; the Health Information and Management Systems Society Conference; the Interagency Institute for Federal Health Care Executives; the Medical Executive Skills Courses; and, the Medical Effects of Ionizing Radiation (MEIR) Courses.

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Specialty Courses for the Military Health System. The Office of CHE sponsored continuing education for numerous specialty courses for the Military Health System during 2004. The following examples convey the scope of service to the Uniformed Services.

Medical Readiness - The Military Medical Humanitarian Assistance Course. The Military Medical Humanitarian Assistance Course is a two-day interactive course designed to train United States military health care providers to deliver optimal medical care to civilian populations, primarily women and children, in the aftermath of humanitarian emergencies. Prior to this course, a void existed in preparing medical officers with the necessary skills, knowledge, and confidence to actively participate in such missions. Given the United States military's involvement in Military Operations Other Than War (MOOTW), this course familiarizes clinicians with the unique aspects of humanitarian missions, so that they are best prepared to actively participate in and lead future missions. Though the health issues are often predictable, the paradigm presents issues that rapidly progress to the severest degree. Resources are typically more limited than in other operations, complicating any attempt for immediate intervention. The course emphasizes practical skills and techniques, not often addressed in the curriculum of American medical education, which will be useful to the provider who is challenged to provide the best possible medical care in an austere environment. The faculty, who present this course, are committed to the quality and credibility of this educational experience. All clinical instructors have had personal experience practicing medicine in an austere health environment; and, all of the clinical cases are derived from real experiences in operational medicine. This course was developed at USU under the sponsorship of the Dean, School of Medicine, and the Department of Pediatrics. During 2004, the course was held nine times for 155 physicians and 49 others.

Distance Activities. During Fiscal Year 2004, the increase in Internet activities continued. The following activities were available:

DoD Smallpox Vaccination: Standard Training - The threat of smallpox provided the momentum for a partnership between the DoD Military Vaccine Agency (MILVAX) and USU. *DoD Smallpox Vaccination: Standard Training* consists of sessions grouped specifically for three levels of professional smallpox vaccination program responsibility. Since the beginning of this activity, 3,286 participants have successfully completed these sessions. Of these, 523 physicians, 325 nurses, and 27 ACHE members were able to earn the following credit: up to 53.5 continuing medical education (CME); 63.7 continuing nursing education (CNE); and, 10.5 Category II (non-ACHE) credit. This program is available to the general public at <*http://dod.digiscript.com*> at no cost;

Military Vaccine Agency (MILVAX) Spokesperson Training Course - *The Military Vaccine Agency (MILVAX) Spokesperson Training Course* started during Fiscal Year 2004. It is a condensed version of a three-day conference, which provides a variety of information related tasks regarding the Anthrax Vaccine Immunization Program (AVIP) and the Smallpox Vaccination Program (SVP) through either an administrative or clinical focus. This activity is available to the general public at <*http://dod.digiscript.com*> at no cost;

MedPix - An On-Line Medical Image Database - *MedPix, an on-line Medical Image Database,* has been developed by the USU School of Medicine Departments of Radiology and Radiological Sciences and Biomedical Informatics. MedPix provides a summary of case studies with images and links for further study. This site targets practicing physicians and nurses, residents, medical students, and graduate nursing students and enables them to enhance their radiological diagnostic skills. Participants who successfully complete four cases are awarded one category 1 CME credit for physicians and 1.2 contact hours of CNE credit for nurses; CHE has awarded over 4,000 CME and CNE credits since April of 2003. This program is available through registration at <*http://rad.usuhs.mil/medpix*> at no cost;

On-Line Education Series Focused on Quality of Care - The National Quality Management Program (NQMP) collects data on key health care quality indicators from Military Treatment Facilities, analyzes it, and compares findings to national benchmarks. A partnership was formed with the Affiliated Computer Services (ACS) Federal Healthcare, TRICARE Management Activity, and USU to produce an educational program to positively influence the quality of care provided to military health care beneficiaries. In Fiscal Year 2004, this on-line education series had 11 activities related to the Military Health System: *Childhood Immunization; Chlamydia Screening; Breast Cancer Screening; Cervical Cancer Screening; Asthma Care; Tobacco Use Cessation; Management of Dyslipidemia; Diabetes Care; Post Deployment Health; Depressive Disorder Care, and Post Deployment Care Evaluation and Management in 2003*. This educational series is available at <*http://www.nqmp.info*> at no cost;

Learning Center Series of the Military Health System Optimization & Population Health Support Center - On-line since January of 2004, the *Learning Center Series of the Military Health System Optimization & Population Health Support Center (MHSOPHSC)* focuses on the theory and benefits of individual health optimization through population health improvement. This series has eight activities, including: *Case Management 1 and 2; Value of Accurate Preventive Medicine Coding; Utilization Management 101;*

Milliman Ambulatory Care Guidelines - 8th Edition; Overweight and Obesity Professional Education; 12-Step Utilization Management Process; and, InterQual Products Overview. USU provides these continuing education activities for physicians, nurses, and social workers at <*http://www.mhsophsc.org/public/home.cfm*> at no cost;

Medical Responses to Weapons of Mass Destruction - The *Medical Responses to Weapons of Mass Destruction*, an interactive, on-line course, was designed to provide information and decision skills critical to the successful management of patients exposed to biological warfare agents. World-recognized experts from USU developed the course content. Teaching methods include audio and print lectures, case studies, and tests to measure content mastery. During the past year, USU provided 9 physicians up to 18 Category 1 credits. The course is available to institutional purchasers at <*www.wmdcourse.com*>; and,

Periodical: Current Advancements in Deployment Medicine - The Journal of Special Operations Medicine is a quarterly peer-reviewed journal geared to Special Operations Forces medical professionals. Its mission is to promote the professional development of Special Operations medical personnel by providing a forum for the latest relevant advancements in deployment medicine. USU provides continuing education to health providers who read the article(s) and successfully complete the post-test(s). The Journal of Special Operations Medicine is available at <*http://www.hurlburt.af.mil/jsou*>.

Other Courses/Activities Sponsored by CHE During 2004:

The International Spine Workshops - The International Spine Workshops (Cervical, Peripheral Nerve, Thoraco-Lumbar) provide surgeons state-of-the-art, hands-on cadaver, spinal instrumentation surgical experiences that cover the gamut of modern spinal surgery;

The Annual Capital Conference Family Practice Board Review - The Capital Conference Family Practice Board Review is sponsored for family physicians in preparation for the American Board of Family Practice Certification Examination;

Surgical Topics - Surgical Topics include Advanced Gynecological Laparoscopy and Hysteroscopy, Gynecologic Surgical Pelvic Anatomy and Dissection, the Military Vascular Surgery Symposium, and the Annual Pediatric/Pediatric Surgery Symposium; and,

TriService Video Endoscopy - Two Courses on TriService Video Endoscopy provide a forum for Perioperative Nurses to update their knowledge and skills in endoscopic procedures, instrumentation and problem solving strategies related to video endoscopy technology.

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Association of Military Surgeons of the United States (AMSUS) Annual Meeting. Since the 99th Annual Meeting in 1992, CHE has worked with AMSUS to provide continuing education credit for their Annual Meetings. AMSUS was established in 1891, and incorporated by an Act of Congress in 1903, as the Society of the Federal Health Agencies. As such, it contributes to the improvement of all phases of the Federal Health Services. The constituent services of AMSUS include the medical departments of the United States Army, Navy, Air Force, and Public Health Service, and the Department of Veterans Affairs. For Fiscal Year 2004, the United States Public Health Service Commissioned Corps hosted the AMSUS 109th Annual Meeting, *Partnerships in Preparedness, Prevention and Public Health: Protecting the Nation*, held on November 16 - 21, 2003, in San Antonio, Texas,with 5,124 attendees. During the AMSUS Fiscal Year 2004 Annual Meeting, the USU Office of CHE offered 144 sessions for continuing education credit in five disciplines (a 300 percent increase from the 47 sessions offered in two disciplines during the AMSUS Fiscal Year 1993 Annual Meeting).

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GENERATED COST AVOIDANCE FOR DOD BY CHE

CHE Generates Cost Avoidance for DoD - $4,988,321. In carrying out its principal responsibilities during Fiscal Year 2004, CHE sponsored continuing medical education for 1,045 activities with an attendance of 7,996 physicians; provided continuing nursing education for 102 activities with an attendance of 3,231 nurses; approved Category II (non-ACHE) continuing education credit for 57 programs for 873 members of the American College of Healthcare Executives; and, provided seven continuing education activities for 83 psychologists and 33 activities for 126 social workers. Because the USU Office of CHE brings medical training to the medical health care professionals, an estimated cost avoidance of $4,988,321 was generated for the DoD by eliminating extensive travel expenses and time away from the hospitals and clinics (the total cost avoidance was calculated by subtracting all of the operating costs for the USU Office of CHE, to include civilian and military manpower, from the total of savings generated by the elimination of travel, per diem and significant commercial registration expenses ($5,886,610 - $898,289 = $4,988,321).

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SUPPORT FOR OTHER FEDERAL ORGANIZATIONS

National Aeronautics and Space Administration (NASA) Teleconference Continuing Education Series. Another example of service to other Federal agencies was the sponsorship with NASA of two continuing education series on *Travelers' Health and Safety* and *Psychological and Behavioral Impact*. Video-teleconferencing systems connected live seminars to: the Institute for Biomedical Problems located in Moscow; the Institute of Telemedicine in Toulouse, France; the Medical Informatics Center at the Medical College of Virginia; the Robert Byrd Health Sciences Center at West Virginia University; the USU campus; and, the 14 NASA Centers. These seminars are part of the continuing initiative of the NASA Office of Life and Microgravity Sciences and Applications to provide continuing education for the NASA employees and contractors and to promote international understanding and interactions among the international Space Station Project Partners. USU has provided CME, CNE, and ACHE continuing education support for the NASA seminar series since 1998.

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MILITARY TRAINING NETWORK

Mission. The mission of the Military Training Network (MTN) is to develop and implement policy guidance and ensure compliance with curricular and administrative standards for resuscitative and trauma medicine training programs for the Uniformed Services and Department of Defense (DoD) affiliates. The MTN supports medical readiness through continuing health professional resuscitative and trauma education for service members world-wide. The TriService MTN staff provides service-specific expertise, central record keeping, and worldwide coordination of training programs.

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Background. The MTN was established, in 1982, by the DoD Health Council for the purpose of training, registration, coordination, and centralized record keeping for resuscitative medicine programs. The MTN falls under the purview of USU, and is organized under the Senior Executive Director, USU Office of Continuing Education for Health Professionals.

The MTN has been recognized as an American Heart Association (AHA) Regional Training Center since 1984 and as the American College of Surgeons (ACS) Region 13 Program Coordinator since 1996. Over the past six years, more than one million service members have attended MTN training programs.

United States Army, Navy, and Air Force personnel equally staff the MTN, which is resourced by USU. The operation of the MTN would not be possible without the additional support provided by the Service Surgeons General.

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Strategic Goals. The MTN has identified five goals for its strategic focus:

Deliver quality, nationally recognized training programs to ensure optimal Medical Readiness for the Department of Defense;

Quantify compliance of MTN affiliated Training Sites to American Heart Association Guidelines through site visits and record audits. Validate Self-Review findings with targeted Site Review visits to 10 percent of MTN's training locations, including OCONUS, over the next two years;

Provide top-notch customer service by enhancing MTN administrative processes to include upgrading automation systems and on-line customer resources;

Preserve fair cost structures from vendors and international/national organizations that support MTN Training Sites; and,

Enhance excellence through the professional development of appointed training site staff including Program Directors, Administrators, and Training Site Faculty.

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Worldwide Capabilities Essential to Medical Readiness. The American Heart Association and the American College of Surgeons (ACS) recognize the USU MTN as a Regional Training Center/ Region Program Coordinator through written agreements. The resuscitative and trauma medicine training programs administered by the MTN include: Advanced Cardiac Life Support (ACLS); Advanced Trauma Life Support (ATLS); Pediatric Advanced Life Support (PALS); and, Basic Life Support (BLS). **During the past year, MTN held 887 continuing medical education credited courses; these courses, along with BLS, trained 232,884 DoD personnel.**

As an AHA Training Center and ACS Program Coordinator, the USU MTN provides transportable, worldwide training reciprocity for service members. In addition, the MTN structure provides training in strategically critical areas throughout the world (i.e., Afghanistan, Iraq, and Korea), on operational platforms (i.e., aboard aircraft carriers), and at remote sites where civilian training would not be available. These capabilities are essential to military medical readiness. **The USU MTN is the only American Heart Association affiliate with worldwide reciprocity for its health care providers**.

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MTN Generates Significant Savings for DoD - $11,997,930. Department of Defense sites affiliated with the MTN are approved to conduct self-sustained resuscitative and trauma medicine training. This continues to prove cost-effective for the Military Health System because it eliminates the need to pay premium training costs for civilian resuscitative and trauma medicine programs. For example, during Fiscal Year 2004, 232,884 defense personnel were trained through the USU MTN. The average commercial cost for providing this training is conservatively estimated at $12,957,874. The cost avoidance generated for the DoD during 2004, an estimated total of $11,997,930, was calculated by subtracting all of the USU MTN Office operating costs, to include civilian and military manpower provided by the three Services, from the average commercial cost ($12,957,874 - $959,944 = $11,997,930).

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DOD CENTER FOR EDUCATION AND RESEARCH IN PATIENT SAFETY

Establishment. In the Summer of 2003, the Department of Defense (DoD) Center for Education and Research in Patient Safety (CERPS) was established at USU within the Continuing Education for Health Professionals Directorate.

Mission. The DoD Center for Education and Research in Patient Safety engages the Military Health System Patient Safety Program (MHSPSP) educational needs at the undergraduate, post-graduate, and staff levels of health care practitioners. Particular emphasis is placed on the specific patient safety education and research needs of MHSPSP beneficiaries, command, and administrative staff.

Future Activities. Since the establishment of CERPS in 2003, the scope of activities has been expanded. CERPS developed curriculum for the Department of the Navy for its BMDOC and AMDOC Programs; these materials will be made available to the Army and the Air Force. CERPS will also open a new patient safety website to address the educational needs of medical and nursing students, health care providers, and staff throughout the MHS. In addition, educational programs are under development for CERPS' on-line distance learning activities to introduce and sustain the DoD patient safety initiatives.

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VII. THE ARMED FORCES RADIOBIOLOGY RESEARCH INSTITUTE

The Armed Forces Radiobiology Research Institute distinguished itself by exceptionally meritorious achievement from 11 September 2001 to 20 June 2003, in response to acts of terrorism and nuclear/radiological threats at home and abroad. The Institute's expert guidance and critical training and information services became especially evident with the September 11, 2001, terrorist attacks on the World Trade Center and the Pentagon, followed by the anthrax threat to the nation's mail system, all while nuclear/radiological dangers abroad demanded attention. The Institute's military and civilian employees provided expert advice and extensive training to the military services; to regional, state, and federal government organizations, including the White House staff; and to civilian first responders, including those in New York City and Washington, D.C. When anthrax-contaminated mail threatened to shut down the mail system, the Institute's scientists, engineers, and technical and administrative staffs significantly aided various federal agencies and the Office of the President of the United States to protect and decontaminate the distribution system. At the same time, the Institute supported national antiterrorism programs and military exercises and operations. For Operation ENDURING FREEDOM in Kuwait, the Institute developed emergency response plans; and for Operation IRAQI FREEDOM, it provided guidance on treatment of personnel with embedded depleted uranium or tungsten alloy fragments and conducted studies on the use of ionizing radiation to decontaminate human remains. By their exemplary performance of duty, the members of the Armed Forces Radiobiology Research Institute have brought great credit upon themselves and to the Department of Defense.

- **Donald Rumsfeld, Secretary of Defense,** Citation to accompany the Joint Meritorious Unit Award, signed on February 17, 2004.

RELEVANCE

Background. The Armed Forces Radiobiology Research Institute (AFRRI), a TriService organization, is located in a 173,242 square foot complex on the campus of the National Naval Medical Center (NNMC) in Bethesda, Maryland. AFRRI was chartered in 1961, to conduct relevant applied radiobiological research in support of the military medical mission and to support accidental or premeditated events involving nuclear weapons, nuclear reactors, radiological dispersal devices, and other nuclear/radiological situations. The AFRRI complex houses a 1 Megawatt TRIGA nuclear reactor, a cobalt-60 irradiation facility licensed for up to 400,000 Curies, a 54 Mev linear accelerator, a 100 Curie cobalt-60 chronic irradiation facility, a full-service veterinary facility accredited by the Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC) International, and a full complement of laboratory and administrative spaces. Particularly unique features of the TRIGA nuclear reactor are its ability to simulate the high prompt doses of gamma and neutron radiation from the detonation of a nuclear weapon and its two exposure rooms that can accommodate experimental work involving large-animal models and other large irradiation studies. Human resources consist of 160 professional, technical, and administrative personnel. About 60 percent are civilian; and, 40 percent are military personnel.

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Governance. On September 22, 1992, the Deputy Secretary of Defense approved a program decision memorandum and transferred the management of AFRRI from the Defense Nuclear Agency (DNA) to USU; the Director of AFRRI reports directly to the President of USU. An Administrative Plan for program execution and administrative support for the integration of AFRRI as an Institute within USU was coordinated by the USU Vice President for Administration and Management and the Director of AFRRI; the USU President approved the plan in October of 2000. The Office of the Director, Defense Research and Engineering (DDR&E) directly funded AFRRI's programs and provided management oversight of its research programs through the Director, Bio Systems.

On August 17, 2000, DDR&E suggested that USU revise its DoD Directive 5105.45 to reflect the placement of AFRRI within USU. That suggestion was followed and on November 13, 2000, the USU President approved a draft revision of the USU Directive as coordinated by the USU Vice President for Administration and Management and the Director of AFRRI, with the executive staff of both USU and AFRRI. Upon further guidance from the Office of the Secretary of Defense (OSD), the submission of the draft DoD Directive for OSD approval was postponed pending the reprogramming of funding lines.

In January of 2002, the OSD Comptroller approved Program Budget Decision (PBD) 203C that was to transfer funding and management responsibility for the AFRRI programs to the National Institutes of Health (NIH); AFRRI was to remain a DoD asset and NIH was to continue funding its programs on a reimbursable basis. The USU President, the Director of AFRRI, and other senior representatives of USU and AFRRI began a coordination effort with the Acting Director of NIH to develop plans for: 1) the implementation of a reimbursement process between NIH and DoD for the AFRRI programs; and, 2) the establishment of a program management strategy for AFRRI under a memorandum of understanding between DoD and NIH. Before this coordination process was completed, the transfer of AFRRI funding to NIH was disapproved during the Health and Human Services' Fiscal Year 2003 Appropriations Process. As a result, in November of 2002, PBD 630, *Congressional Adjustments to Investment Appropriations*, was issued placing funding authority for the AFRRI programs back with the DoD. At that time, it was too late in the DoD appropriations process to restore funding for AFRRI in Fiscal Year 2003. Thus, funding for the AFRRI programs during Fiscal Year 2003 required Prior Approval Reprogramming Authority; and, AFRRI was funded at its previously programmed amount. During Fiscal Year 2004, AFRRI funding was placed in the Defense Health Program by DDR&E and transferred to AFRRI through USU.

In February of 2004, the USU Office of the General Counsel was delegated by the USU President to finalize the coordination process for revising the University's DoD Directive 5105.45 to include AFRRI (final coordination to include the USU Board of Regents, the USU Executive Committee, the current AFRRI Board of Governors, the Navy Bureau of Medicine and Surgery, relevant offices in OSD, and others, as appropriate). During the February-March 2005 timeframe, USU was notified by OSD that AFRRI would continue to have its own DoD Directive 5105.33; however, the USU Directive 5105.45 would be updated to include reference to the AFRRI Director reporting to the USU President. Coordination is currently on-going.

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Mission. AFRRI must 1) conduct applied radiobiological research to develop militarily relevant medical countermeasures against radiation injuries; 2) maintain a Medical Radiobiology Advisory Team to support accidental or premeditated events involving nuclear weapons, nuclear reactors, radiological dispersal devices, and other nuclear/radiological situations; 3) advise the Joint Chiefs of Staff (J-4 Medical); the Deputy Assistant to the Secretary of Defense, Nuclear Matters; the Joint Forces Command; and, the

Surgeons reporting to the Combatant Commanders on medical nuclear defense; and, 4) train DoD medical personnel on the management and treatment of radiation casualties (Medical Effects of Ionizing Radiation [MEIR] Course).

> **I want to thank you personally for the help we at CIA have received from AFRRI. CIA has been committed to ensuring the safety of our mail and AFRRI has been absolutely essential in our efforts. The assessment of the effectiveness of our mail treatment processes would be impossible without your help.** *(Prior to September 11, 2001, and the distribution of anthrax through several United States Post Offices, AFRRI researchers had studied the effects of irradiation on biological agents and had established a standard dosage of radiation necessary to eradicate anthrax spores. The researchers used a harmless surrogate spore that mimics the biological properties of live anthrax spores. This non-toxic spore can easily be placed in an envelope, and then tested after irradiation procedures at a specific mailing distribution area; the spore allows extensive testing for quality assurance to ensure the safety of those individuals who will handle the mail. Since September 11th, through 2004, AFRRI scientists have provided relevant information and on-going briefings to numerous entities such as the White House Medical Unit, the House Science Committee, Senate and House professional staff, the Department of Homeland Security, the Centers for Disease Control, the Armed Forces Institute of Pathology, the General Accounting Office, and the Federal Bureau of Investigation.)* **Specifically, I want to point out the following individuals for their superb effort: Gregory Knudson, Ph.D.; Mike Shoemaker, Ph.D.; and, Thomas Elliott, Ph.D. They have been most gracious and accommodating to our needs at the CIA. Without the help of these individuals, we at CIA would not have been able to achieve our goals as quickly. It has been and will continue to be a pleasure to work with these individuals.**
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> - **Dr. Brian Hollibush, Environmental Health and Preventive Medicine Officer, Central Intelligence Agency,** Letter to **Colonel Robert Eng, Director, AFRRI,** dated May 8, 2002.

A Unique Program. There is no other comprehensive, militarily relevant radiobiological research program like that at AFRRI. While several initiatives exist in universities and private industry to develop pharmacologic strategies to prevent collateral tissue damage in radiation therapy patients, no other program exists to address the spectrum of radiological injuries anticipated under combat situations involving the use of nuclear or radiological weapons. AFRRI does, however, leverage findings from private sector initiatives to develop countermeasures not only to prevent injuries but also to treat and assess radiological injuries under military operational scenarios. ***Only AFRRI offers a program dedicated to these special military requirements.*** And, ***no other program within the Department of Defense addresses medical radiological defense research requirements***.

The AFRRI complex was designed and built to conduct radiobiology research and to develop medical radiological countermeasures in support of the military medical mission. The TRIGA nuclear reactor provides an ideal source to simulate the prompt radiation pulse from a nuclear weapon. Although there are 49 of these small research reactors in the world, and 18 in the United States, ***only the AFRRI reactor is designed for, and is wholly dedicated to, applied medical radiobiology research for medical readiness***. The AFRRI's second major source is a cobalt-60 irradiation facility. It is designed to safely hold up to 500,000 Curies of cobalt-60, but is currently licensed for 400,000 Curies. Because this source

can produce a high exposure rate with monoenergetic gamma-rays, it is ideally suited for the high-energy photons needed in applied military radiobiology research. A separate cobalt-60 irradiation facility is also housed at AFRRI to provide a source of low-dose-rate gamma photon emissions to conduct radiobiology experiments simulating chronic exposure to low dose radiation sources.

Documented Relevance. Since the terrorist attacks of September 11, 2001, it has become apparent that the risk of deliberate attacks involving the use of radiological or nuclear devices is on the rise. A growing threat exists from small-scale conflicts, terrorist incidents, accidents, and even peacekeeping missions in troubled areas around the world. Each of these scenarios involves real prospects for the use of nuclear or radiological devices, or the uncontrolled or intentional release of hazardous radioactive materials, posing a challenge on the battlefield and to homeland security. Unlike a strategic nuclear exchange, which would devastate infrastructure and all but eliminate prospects for the delivery of any remaining health care resources, casualties of nuclear/radiological incidents in today's threat environments will expect to have quick access to sophisticated medical care. It is essential to ensure that the best possible products of today's technology are available to the personnel of the health care delivery systems who must respond to such disaster scenarios. The military has a clear need for information on the sources and complicating effects of radiation during wartime, terrorist and accident scenarios.

Military planning, deployment and employment decisions in response to nuclear/radiological incidents depend on information available only from test (i.e., experimental), theoretical and/or empirical (event-generated) data. The AFRRI has played a significant role in providing information to devise strategies for early response to high, acute doses of radiation. In addition, ...**"Needs have changed in response to the contemporary world's environment; low-dose, chronic exposures are more likely to occur. There is a growing concern to define accurately the consequences of a variety of such scenarios.... They (AFRRI) demonstrated dedication to, and focus on, the real and current need for information to deal with risk situations already being encountered, or likely to be encountered, by Armed Services Personnel. It was made clear that changing world conditions have posed new threats for which there are little or no data. The need for new data comes at a time when the scientific community's ability to respond has been severely restricted by worldwide closings of radiobiological research centers. AFRRI has value because it is designed and organized to generate these types of data, and because it is one of the very few places that can do so"** (American Institute for Biological Sciences (AIBS) Peer Review on AFRRI, Executive Summary, dated July 1996, pages 1 and 2).

Response Agreements with the Office of the Secretary of Defense Confirm AFRRI's Relevance to DoD. The AFRRI's provision of direct support to the Office of the Secretary of Defense (OSD) and the Joint Chiefs of Staff (JCS) validates its mission relevance and its value to national defense. Upon request during emergency situations, AFRRI deploys teams of technical and scientific experts as consultants to these offices.

March 2001 Technology Area Review and Assessment. The biennial Technology Area Review and Assessment (TARA), held during the week of February 26, 2001, in San Antonio, Texas, noted that advances in medical science and technology indeed portend the prospects that "radiation-induced injuries can be managed" and that major elements of AFRRI's program are "focused on an important problem, with potential impact on homeland defense." No changes were made to these findings during the last TARA conducted in March of 2003.

In summary, the DoD's annual funding of the Medical Radiological Defense Research Program at the Armed Forces Radiobiology Research Institute is a timely investment, which supports relevant medical requirements of the Services. A value-added benefit to DoD and national security is derived from AFRRI's pool of scientific and technical experts in government service, who are available on short notice to provide advice and guidance to high-level offices within DoD, during national emergencies. The AFRRI is poised to continue paying dividends well into the future by ensuring an enhanced medical readiness posture that will save lives and reduce injuries in nuclear/radiological and combined nuclear/biological/chemical (NBC) threat environments.

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TIMELINESS

Doctor Marburger, President Bush's Science Advisor, sent a six-person team, including two AFRRI scientists to the Lima, Ohio plant to evaluate the mail irradiation facility and process. AFRRI scientists, working with National Institutes of Standards and Technology personnel, assembled a container of mail with dosimeters and surrogate spores, took it to Lima, had it irradiated as a quality assessment check, and briefed Doctor Marburger on the results, which found no growth spores at the radiation dose recommended by AFRRI. Dr. Marburger will later brief several government agencies, including the Office of Homeland Defense, at the White House on the results.

- Weekly Activities Report, *Uniformed Services University*, Health Affairs, Office of the Secretary of Defense, November 5-9, 2001.

An Impressive Response. AFRRI routinely disseminates its research findings with the scientific community, within DoD, the private sector, and internationally. Its investigators' publications in peer-reviewed journals, presentations at professional conferences, and reports and recommendations to the TriServices and the Surgeons of the Combatant Commands provide timely information on the mitigation of radiation hazards and optimization of medical treatment strategies for radiation casualties. Research findings are also integrated into the AFRRI-sponsored accredited course on the Medical Effects of Ionizing Radiation (MEIR), the premier high level training medium available to the medical personnel of the Armed Forces for the management of radiological injuries. Attendance and presentations at national and international conferences ensures that AFRRI investigators stay abreast of the latest developments around the world. These activities provide an important source of critical feedback through direct peer interaction; and, they foster recruitment of other scientists who contribute independently to solving problems in radiobiology common to both the military and private sectors. Past studies focused primarily on high radiation doses, because the military was then concerned with the high prompt dose effects from nuclear weapons detonations. Today, ... **"the AFRRI investigators have been able to use this knowledge, and the experimental approaches, which allowed its development, to design reasonable and logical approaches to the extremely difficult problems of current interest that (in addition to on-going nuclear threats from terrorist activities) involve low doses and possible low dose rates.... AFRRI has always played a national and international role in solving radiobiological problems, interacting with NATO, sending response teams anywhere in the world where they are needed, and training physicians and military personnel to respond to radiation accidents. This role is expanding due to the default of other centers. Key to the ability to uphold this responsibility, and a major strength, is the combination of dedicated radiation sources, animal facilities, and the mixture of military and civilian personnel with expertise in many relevant fields. This allows a think tank approach to experimental design, rapid execution of experiments, and frugal use of resources, including experimental animals"** (AIBS Peer Review on AFRRI, dated July of 1996, page 2).

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AFRRI Fields Medical Training and Provides Rapid Response in Support of DoD Missions.

Support to the Office of Science and Technology Policy - December 2004. The AFRRI Scientific Director co-chairs the Radiological Nuclear Threat Countermeasures Working Group consisting of representatives from the Department of Health and Human Services, the Department of Homeland Security, the Department of Energy, the Department of Veterans Affairs, the National Aeronautics and Space Administration, and the Department of Defense. The Working Group is tasked to develop a list of countermeasures (including prophylactics, mitigators, and postirradiation treatments) and diagnostics (e.g., biodosimetry) that should be considered for acquisition by the Strategic National Stockpile Program and follow the development of new countermeasures to allow their consideration for acquisition as soon as appropriate.

Support to Mass Casualty Drill at NNMC - October 2004. Twenty-five AFRRI personnel participated as "victims," expert lecturers, drill evaluators, photographers, and reporters in the October 21, 2004 Bioterrorism Disaster Drill conducted at the National Naval Medical Center (NNMC) in Bethesda, Maryland. The drill tested the coordinated response among military and civilian hospitals to the mock explosion of a "dirty bomb." Altogether, 800 people, including 30 emergency response teams, participated in the day-long exercise that included NNMC, the Uniformed Services University of the Health Sciences, the Walter Reed Army Medical Center, the National Institutes of Health, the Montgomery County Emergency Services, and Suburban Hospital, which serves Montgomery County.

Support to Biodefense Methods Against Anthrax - June 2003 through September 2004. Two AFRRI scientists were invited to participate in setting up and reviewing studies that led to the approval of two biodefense methods for the detection of *Bacillus anthracis* spores (the bacterial pathogen that causes the disease anthrax). The Department of Homeland Security and the Department of Defense Office of Science and Technology Policy funded the studies conducted by AOAC International. The studies established a method for confirming the identification of pure cultures of *B. anthracis*, as well as, a hand-held assay for the presumptive detection of *B. anthracis* spores. The assay will be field-tested for use by first responders.

Support to the Department of Health and Human Services - September 2004. Two AFRRI personnel provided assistance to the Department of Health and Human Services during a national security event (the Republican National Convention).

Support to the Defense Threat Reduction Agency - September 2004. Three AFRRI military personnel supported the Defense Threat Reduction Agency at Malmstrom Air Force Base, Montana, during the exercise, *Diligent Warrior 04*.

Support to the Environmental Protection Agency - April 2004. ***The United States Environmental Protection Agency (EPA), in April of 2004, awarded its prestigious Gold Medal for Exceptional Service to two AFRRI research microbiologists who served as part of EPA's 19-member Brentwood Post Office Anthrax Crisis Exemption Team,*** which evaluated methods that might be used to inactivate deadly *Bacillus anthracis* spores that had contaminated the huge United States Postal Service Brentwood Processing and Distribution Center in Washington, D.C., and closed it on October 21, 2001. The researchers were the

only Department of Defense employees honored during 2004 with the EPA's highest honor; they were recognized for their extraordinary contributions to the safe and effective fumigation with chlorine dioxide gas to inactivate the anthrax spores. Chlorine dioxide gas had also been used earlier at the decontamination of the Senate Office Building, but use of the highly lethal gas at the Processing and Distribution Center was complicated by the size of the facility (633,000 square feet); by the need to maintain a precise concentration of the gas, relative humidity, and temperature within the space for at least 12 hours; and, by the proximity of neighborhood residents.

The Team grappled with unprecedented scientific issues: how to determine the nature and extent of *B. anthracis* contamination; how to set correct fumigation parameters allowing for temperature, relative humidity, gas concentration, and contact time; how to monitor inside the building to ensure that fumigation parameters were met; and, how to do extensive air and surface sampling after fumigation to confirm the absence of all viable spores. After a successful decontamination, the Processing and Distribution Center reopened on December 22, 2003. The AFRRI researchers continue to serve on the EPA Interagency Expert Panel on Efficacy Test Methods and Surrogates for Anthrax Spores, which meets quarterly.

Support to the Defense Threat Reduction Agency - February 2004. Three AFRRI military personnel supported the Defense Threat Reduction Agency in Texas and in Colorado for the exercise, *Unified Defense 04*.

Support to the Department of Defense Medical Training - 2004. During Fiscal Year 2004, AFRRI medical professionals and research experts provided the Institute's Medical Effects of Ionizing Radiation (MEIR) Course to 683 students at stateside and overseas venues. Health care and emergency response professionals who attended the course included 281 Army, 32 Air Force, and 79 Navy personnel as well as 291 students who were either Marine Corps, foreign military, Public Health Service, DoD civilian, or Coast Guard personnel.

Support to the National Pharmaceutical Stockpile Program - May 2003. An AFRRI physician serves as the co-chair of a joint Centers for Disease Control and Prevention/Department of Defense Working Group that is chartered to identify pharmaceutical agents for incorporation into the Nation's strategic stockpile to be available for emergency use in the event of nuclear or radiological disasters.

The AFRRI participated in a Radiological/Nuclear Threat Countermeasures Working Group, initiated in May of 2003. The Working Group was co-chaired by the Director of AFRRI and the AFRRI Scientific Director, with the participation of other AFRRI scientists. The Working Group was asked to: 1) define national requirements for therapeutics/protectants and diagnostics; 2) develop acquisition plans for the Strategic National Stockpile purchase of therapeutics/protectants and diagnostics; and, 3) develop a coherent radiological/nuclear threat countermeasures research and development agenda. The Working Group consisted of representatives from a broad range of Federal agencies and included a few key individuals from the private sector. Some of the agencies represented included: Health and Human Services; the Department of Defense; multiple representatives from the National Institutes of Health; the Centers for Disease Control; the Food and Drug Administration; the Department of Homeland Security (Strategic National Stockpile); the Department of Veterans Affairs; the National Aeronautics and Space Administration; and, the Department of Energy.

Support Provided to the Interagency Working Group on Test Methods and Surrogates for *Bacillus anthracis* - October 9-10, 2002. Senior AFRRI investigators were key participants by invitation for an October 9-10, 2002 Interagency Workshop sponsored by the Environmental Protection Agency (EPA). The workshop's goals were to identify the best non-harmful surrogate bacterial organisms to mimic the biological characteristics of *B. anthracis*, the bacterial agent of anthrax, and to establish collaborative research activities needed to assist the EPA in developing scientifically-based guidance on test methods and performance standards for the inactivation of *B. anthracis* spores. Other noted agencies participating in the workshop included the Centers for Disease Control and Prevention, the Defense Threat Reduction Agency, the Naval Surface Warfare Center, the Department of State, the Department of Energy, the National Institutes of Health, the National Institute of Standards and Technology, the Department of Justice, the Federal Drug Administration, the Lawrence Livermore National Laboratory, the Argon National Laboratory, the Department of Homeland Security, the University of Ottowa, and the Dugway Proving Ground.

Support to the European Union on Medical Preparedness for Nuclear/Radiological Events - 2002. As a result of AFRRI's participation in NATO's Research Technology Agency and its research and development programs for radiation medical defense, AFRRI was invited to participate in the European Union (EU) initiative entitled, *Medical Preparedness for Nuclear/Radiological Events*. The EBMT Nuclear Accident Subcommittee has three objectives: 1) conduct assessments of EU medical resources to effectively manage radiation-associated mass casualties; 2) provide guidance to EU members concerning current capacities and the requirements for extended capacities; and, 3) develop a robust network of cooperating EU medical facilities and trained personnel in order to better deal with future nuclear/radiological contingencies.

Support to the Centers for Disease Control and Prevention - July 18, 2002. On July 18, 2002, AFRRI staff provided senior representatives of the Centers for Disease Control and Prevention (CDC) with presentations covering the threats posed by radiological dispersal devices, surreptitious planting of radiation sources, improvised nuclear weapons, and sabotage of nuclear power reactors. The presentations included discussions on the appropriate use of potassium iodide to mitigate risks of thyroid cancer from exposure to radioactive iodine and an overview of AFRRI's role in emergency response, medical training, and research and development.

Support to the Combatant Commander, United States Southern Command, and the Department of State - March 14, 2002. On January 30, 2002, members of AFRRI's MRAT provided a briefing to the Acting Combatant Commander, United States Southern Command (USSOUTHCOM), and six other flag officers and representatives from the United States Department of State on the medical and psychological consequences of a radiological dispersal device (RDD) detonation in a foreign country. The DoD, in conjunction with the State Department, is using the information to develop emergency response plans for personnel assigned to United States embassies located around the world. On March 14, 2002, AFRRI personnel participated with the State Department in an exercise simulating the detonation of an RDD in a foreign embassy. The goal of the exercise was to educate participants on the threats and procedures for providing prompt medical assessment, triage and treatment. The AFRRI continues to provide medical and health physics support to the Department of State by serving on its Weapons of Mass Destruction (WMD) Incident Planning and Coordination Committee and its WMD Response Operations Control Group.

Support to the President's Science Advisor and Office of Science and Technology Policy - March 12, 2002. On March 12, 2002, the AFRRI Director and the head of AFRRI's Military Medical Operations Department briefed the Radiological, Nuclear and Conventional Threats Detection and Response R&D Working Group of the Office of Science and Technology Policy (OSTP) on the capabilities of AFRRI's Medical Radiological Advisory Team.

Training for National Guard Civil Support Teams - March 2002. A Presidential Directive following the incidents of September 11, 2001, established National Guard Civil Support Teams to provide State Governors with cadres of first responders specifically trained and equipped to deal with terrorist incidents involving chemical, biological, radiological, nuclear or explosive (CBRNE) incidents. In March of 2002, AFRRI's Medical Radiological Advisory Team (MRAT) hosted a two-week conference to train personnel assigned as first responders to the newly established civil support teams. The training included lectures on operational health physics, Federal/DoD regulations, risk analysis, radiological instrumentation, DoD and non-DoD radiological assets, and design characteristics of nuclear power plants, radiological dispersal devices and nuclear weapons. Learning objectives focused on decision-making during the crucial first 12 hours following a nuclear/radiological event. The conference was highly successful. As a consequence, the National Guard Bureau of Washington, D.C., has requested the AFRRI MRAT to provide training on an annual basis.

Support to the Vice President of the United States - February 7, 2002. On February 7, 2002, the AFRRI Director and other AFRRI staff briefed the Vice President's Senior Advisor for Medicine and Public Health and the Senior Advisor for Biodefense on the medical consequences of terrorist use of improvised nuclear weapons and radiological dispersal devices.

Support to United States Forces Command - February 12, 2002. On February 12, 2002, the AFRRI Director briefed the principal flag officer staff and Command Surgeon of the United States Forces Command (USFORSCOM) on the radiological risks from potential attacks on, sabotage of, or accidents involving nuclear power plants in areas of operation. The briefing included a review of the Food and Drug Administration (FDA) and DoD policies on the stockpiling and use of potassium iodide for the emergency treatment of personnel exposed to radioactive iodine, which can be released during events involving nuclear power reactors.

Support to the President of the United States - November 19, 2001. On November 19, 2001, members of AFRRI's Military Medical Operations Department spent the morning at the White House training the President's medical unit personnel on the medical effects of ionizing radiation and the latest preventive, assessment and treatment measures that can be applied to mitigate radiation-induced injury.

Medical Radiobiology Advisory Team - February 2001. The AFRRI Medical Radiobiology Advisory Team (MRAT) provides medical and health physics consultation and dose assessment capabilities to the United States military and private sectors around the world for contending with a broad spectrum of nuclear or radiological accidents, incidents, or injuries. For example, the team was on full alert after the terrorist attacks at the World Trade Center and at the Pentagon and during the most recent crisis between India and Pakistan. The AFRRI MRAT is a critical arm of the Defense Consequence Management Advisory Team,

fielded by the Defense Threat Reduction Agency, and is called upon to deploy worldwide in response to incidents involving nuclear weapons, radiological devices, or nuclear power reactor emergencies (i.e., an article in U.S. News and World Report, during February of 2001, illustrated an example of the heightened risk for a radiological event by citing the prospects for nuclear accidents at several locations across the former Soviet Union).

Support to the Secretary of Defense - January 10, 2001. On January 10, 2001, AFRRI provided the Office of the Secretary of Defense with the most current scientific information on the human bioeffects of depleted uranium resulting from various sources of exposure (dermal, inhalation and wounding). The information was used later that day by the Secretary of Defense to address the National Press Club on European concerns over DU exposures among NATO forces in the Balkans.

Response to a Request from the German Ministry of Defense - January 8, 2001. The upheaval within the NATO alliance, stemming from claims by some allied forces and their governments that depleted uranium (DU) exposures during their operations in the Balkans were the cause of serious personal illness, prompted the German Ministry of Defense to seek AFRRI's support in dispelling such claims. The request recognized AFRRI's worldwide leadership role and scientific expertise in studies on the health effects of chronic exposures to DU. Through AFRRI's capacity as Chair of Technical Group-006 of the NATO Human Factors and Medicine Panel, information was provided that greatly helped to defuse the crisis.

Capability to Assist in the Accident of the Russian Submarine Kursk - August 14, 2000. During the aftermath of the Russian submarine accident, AFRRI was asked by the Defense Threat Reduction Agency for medical capabilities that could have been offered to the Russians in anticipation of an official Russian request. AFRRI immediately responded with radiation biodosimetry support to assess the radiation dose to the surviving Russian sailors.

Response to the Tokaimura Nuclear Criticality Accident in Japan - October 2, 1999. AFRRI was in consultation with Dr. Haraguichi at the Tokaimura Prefecture Emergency Operations Center addressing his questions on public health and methods to mitigate the adverse radiophobia and psychological effects of the nuclear incident on the public. AFRRI also provided guidance to the United States Army Japan on measures to reassure the United States military members and their families that they were not in harm's way, to include the monitoring of food sources for the United States community.

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SCIENTIFIC MERIT

Internal and External Review Mechanisms Ensure Standards of Scientific Excellence. The USU and AFRRI have implemented internal and external review mechanisms for the systematic planning, review and analysis of AFRRI's programs to ensure the highest standards of scientific excellence.

Program Management. The AFRRI management has established a management system to provide clear guidance to investigators and ensure oversight of all funded work. The system provides a road map for achieving the overarching objectives of the two appropriated funding lines for *Medical Technology* and *Medical Advanced Technology* in the area of radiobiology research. It serves as the basis for the planning, funding, review, and analysis of all work; and, it ensures that resources are appropriately allocated so that programmatically relevant goals are achieved within specified timeframes and clearly defined metrics of acceptability.

Program Areas. The AFRRI Director and the AFRRI Scientific Director jointly define *Program Areas* that are the major programmatic thrusts for addressing military requirements relevant to AFRRI. A Team Leader heads each *Program Area*, providing scientific leadership and coordination of the component scientific investigations (*projects*).

Projects. *Projects* are the basic work unit of research. Each *project* is described in a detailed written protocol that conveys the study's specific aims, hypothesis, approach, program relevance, milestones, accomplishments, and assessment of resource requirements. Each protocol is reviewed and approved annually by the Scientific Director of AFRRI; recommendations for funding are forwarded to the AFRRI Director before work is initiated. Each *project* lasts up to three years, at which time, a new protocol can be written to continue the line of work, if warranted. An external panel of subject matter experts is convened annually to review all new protocols.

Quality Assurance. To ensure the quality of the research programs at AFRRI, a three-part process has been implemented to regularly evaluate the scientific efforts, military relevance, and management oversight/procedures. The quality assurance process for all AFRRI research projects includes: 1) an annual internal assessment of direction, progress, and scientific plans; 2) external peer review by a panel of subject matter experts for all new protocols; and, 3) periodic broad programmatic reviews for scientific merit and program relevance. In addition, steering committees of experts from outside of AFRRI have been established for those projects where more frequent review and advice is deemed appropriate.

Annual Internal Reviews. All on-going research projects are formally reviewed each year by AFRRI management. Investigators must submit written summaries of their progress on approved protocols. These annual progress reports provide the opportunity for critical assessment of the goals attained; and, if necessary, reevaluation of the project's direction. This internal review process provides program managers, the Scientific Director, and the AFRRI Director with assurances that projects are on course and properly resourced.

External Peer Review. All new research projects are subject to a rigorous peer review by subject matter experts. Investigators must write detailed protocols for up to three years of effort. A peer review panel convenes annually to discuss the scientific merit of the new projects. This external review process ensures that the research is scientifically sound and provides investigators with valuable suggestions for new approaches and directions. The last review of selected protocols occurred during the Fall of 2004.

Comprehensive Program Reviews. Biennially, the Biomedical Defense Science and Technology Reliance Panel, under the auspices of the Armed Services Biomedical Research Evaluation Management (ASBREM) Committee, evaluates the military relevance and scientific merit of AFRRI's research programs through the Technology Area Review and Assessment (TARA) process. The most recent TARA was held in March of 2003. In addition, an independent review by the American Institute for Biological Sciences (AIBS) is conducted periodically. The AIBS program assessment focuses primarily on scientific review and analysis; and, it also considers how effectively AFRRI/USU management executes the planning and funding processes.

Department of Radiation Biology, School of Medicine. The new academic Department of Radiation Biology, within the USU School of Medicine (SOM), was established in 2004. The AFRRI Scientific Director was appointed Founding Chair of the new department and, in this capacity, reports directly to the Dean of the School of Medicine. The SOM Department of Radiation Biology has a basic research foundation oriented to supporting the Medical Radiological Defense Research Program mission of AFRRI. The Department will offer courses in the medical effects of ionizing radiation and, as resources permit, will establish a degree granting program for radiobiology.

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The Quality of AFRRI's Science Measures Well Against National Scientific Capabilities and Standards for Technical Merit.

Technology Area Review and Assessment. The Technology Area Review and Assessment (TARA) panel of March 2001 noted that AFRRI's research thrusts are characterized by ***quality, hypothesis-driven science*** and major elements of the program that employ ***novel methodology*** and ***logical approach*** in executing studies that have the ***potential for significant impact on treatment decisions***. The TARA panel also noted that the productivity of AFRRI's science is reflected in its record of peer-reviewed publications and other printed materials. (A Summary of AFRRI Publications for 2001-2004 is provided at Appendix C.)

The most recent TARA was held in March of 2003. The review panel found no serious concerns and during a briefing to the Defense Science and Technology Advisory Group (DSTAG) on the TARA outcome for AFRRI, the following comments were conveyed: ***1) Significant increase in speed and accessibility of methodology for geographic sampling of populations following a radiological incident; and, 2) Well structured studies; good linkage to transition partner***.

AFRRI's Research Programs Are Globally Recognized. The AFRRI research programs are highly regarded throughout the scientific and medical communities, both nationally and internationally. The following selected accounts of recent activities and engagements testify to this fact:

NATO Research Task Group (RTG) 099 for Radiation Bioeffects and Countermeasures. As Chair of RTG-099, the AFRRI Biodosimetry Team Leader has set in motion the group's first meeting to be held on June 21-23, 2005, at AFRRI. As stated in its Terms of Reference, the group's purpose is to "develop the scientific basis for new and improved methods to prevent, assess, treat, and manage casualties and long-term health effects associated with ionizing radiation exposure from evolving threats in military operations." The RTG-099, which is under the NATO Human Factors and Medicine Panel, has the following goals: 1) develop broad-spectrum bioassessment tools for sensitive, accurate, and reliable detection of radiation-associated injuries; 2) establish underlying bases of health-compromising, performance-decrementing radiation injuries at the molecular, cellular, and organ-system levels; and, 3) based on established origins and mechanisms of radiation-induced pathology induction, develop effective protocols to prevent and treat initial radiation injuries that would otherwise cascade into overt disease, compromising the health and performance of the personnel so affected;

NATO Research Task Group 006 for Radiation Injury and Medical Countermeasures. AFRRI's Radiation Casualty Management Team Leader held the Chair of the NATO Research Task Group 006 for Radiation Injury and Medical Countermeasures. This task group fell under the Human Factors and Medicine Panel of NATO and its membership included radiobiology experts from 13 NATO countries, with Australia as an observer nation; the AFRRI Biodosimetry Team Leader was requested to Chair the follow-on NATO Research Task Group 099 and to carry forward the work of Task Group 006, during 2004;

National Cancer Institute. In December of 2001, AFRRI scientists participated in organizing and conducting an interdisciplinary workshop sponsored by the National Cancer Institute (NCI) to address scientific progress in molecular, cellular and whole animal radiobiology and biodosimetry, and the impact on current and future treatments to prevent or ameliorate radiation damage to normal tissues. A report of the meeting entitled, *Molecular and Cellular Biology of Moderate Dose Radiation and Potential Mechanisms of Protection*, appeared in Radiation Research, Volume 159, pages 812-834, during 2003. During Fiscal Year 2004, AFRRI scientists participated in the NCI workshop, *Models for Evaluating Agents Intended for the Prophylaxis Mitigation and Treatment of Radiation Injuries*, and co-authored the report that appeared in Radiation Research, in December of 2004;

HazMat Explo 8 Conference. A senior AFRRI medical officer was an invited speaker at the *November 2004 HazMat Explo 8 Conference* held in Las Vegas, Nevada. He lectured on the emergency management of radiation casualties and the treatment of victims with significant radiation exposure;

National Research Council's Committee on Standards and Policies for Decontaminating Public Facilities Affected by Exposure to Harmful Biological Agents: How Clean Is Safe? An AFRRI research microbiologist/pharmacologist was invited to speak at the Committee's October 14, 2004 meeting in Woods Hole, Massachusetts; he shared his expertise, which was demonstrated during environmental testing at the *Bacillus anthracis* contaminated Brentwood Post Office and as a member of the Intergovernmental Environmental Clearance Committee;

United Kingdom Ministry of Defense. A senior AFRRI scientist provided a briefing to Doctor John Jenner, from the United Kingdom, at the AFRRI complex in Bethesda, Maryland, on October 12, 2004. The topic was the investigation of the health effects of embedded tungsten alloy fragments in rats, an embedded WA project overview;

United States and United Kingdom Information Exchange Agreement 1443 Meeting. A senior AFRRI scientist presented information on tumor induction in rats caused by embedded tungsten alloy fragments at the meeting conducted by the United States Army Research Laboratory's Weapons and Materials Research Directorate located at Aberdeen Proving Ground, Maryland, on June 24, 2004;

National Institute for Allergy and Infectious Diseases. The AFRRI Scientific Director served as a session chair at the National Institute for Allergy and Infectious Diseases (NIAID) meeting on *Animal Models for Radiation Injury, Protection, and Therapy*, which was held on May 25-26, 2004;

NATO Human Factors and Medicine Panel Symposium. An AFRRI senior scientist was invited to speak at the NATO Human Factors and Medicine Panel Symposium entitled, *NATO Surveillance and Response: Research & Technology Opportunities and Options*. The symposium took place on April 19-21, 2004, in Budapest, Hungary;

Military and Civilian Federal Agencies. An AFRRI researcher was an invited participant in the *Second Civilian-Military Anthrax Response Technical Workshop* held on April 13-14, 2004. The workshop enabled the sharing of information on the state of technologies and procedures associated with anthrax detection and sampling, risk assessment, and decontamination;

International Atomic Energy Agency Working Group. AFRRI scientists are invited members of the International Atomic Energy Agency's (IAEA) Working Group tasked to review and update the agency's Biodosimetry Manual (IAEA Report No. 260). This manual serves as the current basis for the standardization of cytogenetic-based assays for radiation dose assessment. ***The updated manual, released in 2001, includes, for the first time, reference to the premature chromosome condensation assay pioneered and published by the AFRRI Biodosimetry Team***. In addition, during November of 2002, the IAEA invited two AFRRI staff members to review and contribute to the updating of official guidance on *Generic Procedures for Medical Response during Nuclear and Radiological Emergency*. Coordination with the IAEA has been ongoing; draft #12 of an updated biodosimetry manual was submitted for review in April of 2004;

The National Council on Radiation Protection and Measurements. In 2003, the National Council on Radiation Protection and Measurements (NCRP) elected an AFRRI senior scientist to serve a four-year term on the Council. This AFRRI scientist, as the Chair of the Program Committee for the Annual Scientific Meeting of the NCRP, put together the April 2004 Symposium, *Advances in Consequence Management for Radiological Terrorism Events*. In addition, during 2004, AFRRI scientists were invited to participate in the NCRP Committee's development of two new reports on radiation injury and terrorist events;

United States Northern Command. Two AFRRI staff members, a researcher and a radiation specialist, were invited to brief at the *United States Northern Command's Mass Fatality Workshop*, held on March 23, 2004; they addressed radiation decontamination of anthrax-contaminated remains;

Japanese Ground Self Defense Force. AFRRI directors and scientists briefed six officers from the Japanese Ground Self Defense Force on March 16, 2004; AFRRI personnel addressed the visitors' interests in the effects of exposure to radiation resulting from radiation dispersal devices and in the use of radiation as a countermeasure to biological warfare agents. Topics included nuclear/radiological medical readiness, military medical operations, and the neutralization of biological agents in the mail. The visit included a demonstration of AFRRI's *Biodosimetry Assessment Tool* software application and tours of the research reactor facility, the gamma irradiation facility, and AFRRI's animal facility;

NATO Workshop. Three AFRRI scientists were invited speakers at the *NATO Advanced Research Workshop* held on March 9, 2004, in Budapest, Hungary. They addressed their involvement in combating terrorism directed through the United States mail, the radiation decimal reduction curve for *Bacillus anthracis* Ames, and the inactivation of biological and chemical warfare agents with ionizing and non-ionizing radiation;

Department of Veterans Affairs. AFRRI scientists presented pertinent information to the Department of Veterans Affairs Research Advisory Committee on Gulf War Illness in Washington, D.C., on February 24, 2004;

Defense Research and Development Canada. The AFRRI Scientific Director presented information on the health effects of depleted uranium with an overview of AFRRI's research at the *Defense Research and Development Canada (DRDC) Depleted Uranium-Technical Meeting* held in Ottawa, Canada, on February 19-20, 2004;

New York City Office of the Chief Medical Examiner. An AFRRI scientist, addressing radiation decontamination of biological warfare remains, was an invited speaker at a February 11, 2004 meeting attended by representatives of the New York City Police and Fire Departments and Emergency Management Services and Planning Operations as well as by representatives from the Department of Homeland Security, the Federal Bureau of Investigation, and the Department of Defense;

United States Army Heavy Metals Office, Stevens Institute of Technology. A senior AFRRI researcher presented AFRRI's findings on tumor induction in rats caused by embedded tungsten alloy fragments at the *Heavy Alloys Workshop Annual Meeting* held in Hoboken, New Jersey, on February 10-11, 2004;

United States Army Center for Health Promotion and Preventive Medicine. A senior AFRRI scientist briefed the United States Army Center for Health Promotion and Preventive Medicine (CHPPM) Commander, Brigadier General William T. Bester, on January 22, 2004, at Aberdeen Proving Ground, Maryland; the topic was on AFFRI's research involving the preliminary observation of tumor induction in rats caused by embedded tungsten alloy fragments;

National Institute of Allergy and Infectious Diseases. In the Fall of 2003, under an interagency agreement between AFRRI and the National Institute of Allergy and Infectious Diseases (NIAID) to establish a cooperative relationship, NIAID committed to provide AFRRI with funding to support several studies of mutual interest on the development of medical radiological countermeasures during Fiscal Year 2004; AFRRI scientists were asked to participate in numerous workshops and panels during 2004 to assist NIAID in determining the next steps for research in radiation biology. These workshops included *Animal Models for Radiation Injury, Protection, and Therapy*; a *Blue Ribbon Panel Meeting*; and, an *Animal Endpoints Workshop*;

International Standards Organization. Upon invitation, another AFRRI senior scientist serves as the United States Representative to the International Standards Organization (ISO) Working Group #18, which was convened during 2002, to develop performance standards for specialized laboratories performing radiation dose assessments using cytogenetic procedures. Working Group #18 produced standards for a cytogenetic reference assay, which were ratified by the ISO, in 2002. The working group continued the initiative to develop reference standards for a rapid TRIAGE-based cytogenetic assay, throughout 2003 to the present;

Department of Homeland Security. In 2003, an AFRRI-developed software application for use to support medical recording following a radiation accident, ***The Biodosimetry Assessment Tool***, was recommended for use during a CDC webcast and in a document prepared by the Department of Homeland Security Working Group on Radiological Dispersal Device Preparedness;

University Technology Development Fund. During 2003, an AFRRI Principal Investigator and three USU Co-Investigators secured a grant from the Maryland Technology Development Corporation's University Technology Development Fund (UTDF) to advance their studies in developing protective strategies against damage to normal tissues during radiation therapy for prostate cancer. The UTDF recognizes university researchers throughout Maryland for their potential contributions in their fields of study and to the economic vitality of the State. ***This award is a first for USU.*** A member of the Radiation Casualty Management Team is the Principal Investigator on the grant;

The World Space Congress. An AFRRI senior scientist was invited to present an abstract entitled, *Radiation Biodosimetry: Applications for Space Flight*, at The World Space Congress 2002/34th Committee on Space Research Scientific Assembly in Houston, Texas; a full manuscript of the abstract was published in Advances in Space Research, during 2003;

Presidential Office of Science and Technology Policy. The Director of AFRRI and the AFRRI Scientific Director served as Co-Chairs on a Federal-level working group under the direction of the President's Office of Science and Technology Policy to assess radiological/nuclear threat countermeasures, during 2003. A product of the working group included a prioritized listing of necessary research to provide medical radiological defense. An AFRRI senior scientist Co-Chaired the Biodosimetry Subgroup to the Working Group;

National Disaster Medical System Conference. An AFRRI senior scientist was an invited speaker on *Biodosimetry Options for Clinicians Responding to a Mass Radiation Casualty Event* at the 2003 National Disaster Medical System Conference held in Reno, Nevada;

Sixth Annual Force Health Protection Conference. Three AFRRI scientists were invited speakers at the 6th Annual Force Health Protection Conference held in Albuquerque, New Mexico, in August of 2003;

International Congress of Radiation Research. Two senior scientist from AFRRI were invited speakers in a special session of the International Congress of Radiation Research entitled, *Bio-terrorism and Radiation, What to Do? What Research Is Needed?* The special session was held in Brisbane, Australia, in August of 2003;

The Health Physics Society. Two AFRRI scientists were invited speakers at the 2003 Topical Meeting of the Health Physics Society, in a Session entitled, *Biophysical and Biological Techniques for Retrospective Radiation Dosimetry*, held in Houston, Texas, on January 29, 2003;

National Institute of Standards and Technology. Two AFRRI scientists were invited speakers at the *11th Annual Meeting of the Council on Ionizing Radiation Measurements and Standards* at the National Institute of Standards and Technology held in October of 2002. The Council provides leadership and dissemination of information on a wide range of topics dealing with ionizing radiation measurements and standards;

Centers for Disease Control. An AFRRI senior scientist served as an invited expert in a Centers for Disease Control (CDC) Roundtable entitled, *The Identification of Emerging Strategies for Hospital Management of Mass Casualties from a Radiological Incident*, held in Atlanta, Georgia, during May of 2002;

International Conference on Low-Level Radiation Injury and Medical Countermeasures. AFRRI planned, organized and hosted a highly successful International Conference on *Low-Level Radiation Injury and Medical Countermeasures*. Held in November of 1999, the conference attracted over 147 participants and included several of the world's most preeminent radiobiologists. A combined total of 72 oral presentations and posters were given over the course of three days. The proceedings of the conference were published in a special issue of Military Medicine, the International Journal of AMSUS, Supplement to Military Medicine, Volume 167, No 2, in February of 2002;

The European Commission Directorate for General Research and Technical Development. One of AFRRI's senior scientists was invited to deliver a keynote lecture at the *Advanced Research Workshop on Protracted, Intermittent or Chronic Irradiation: Biological Effects and Mechanisms of Tolerance*. The workshop was an international meeting held at the University of Ulm, in Ulm, Germany, on May 14-17, 2001; it was sponsored by the European Commission Directorate for General Research and Technical Development, the International Searle Foundation, and the University of Ulm;

Department of Energy. An AFRRI senior scientist was an invited speaker at the *4th International Conference on the Medical Basis for Radiation Accident Preparedness* sponsored by the Radiation Emergency Assistance Center/Training Site (REAC/TS) of the Department of Energy. The conference was held in March of 2001, and addressed issues and current advances in the management of acutely irradiated or contaminated patients. The AFRRI Biodosimetry Team also organized and hosted a workshop, *Updates on the Current Dose Assessment Techniques: Biological*, in conjunction with the REAC/TS Conference;

International Conference on the Operational Impact of Psychological Casualties from Weapons of Mass Destruction. AFRRI planned, organized, and hosted a highly successful International Conference on the *Operational Impact of Psychological Casualties from Weapons of Mass Destruction*, in July of 2000. Keynote speakers included the Principal Deputy Under Secretary of Defense for Personnel and Readiness and the Deputy Assistant to the Secretary of Defense for Chemical and Biological Defense; and,

The National Academy of Sciences and the United Kingdom Ministry of Defense. Members of the AFRRI Depleted Uranium (DU) Team were invited to make formal presentations on AFRRI's DU research findings to the National Academy of Sciences, the Institute of Medicine, the United States Army Heavy Metals Office, the United Kingdom Ministry of Defense, and the Committee on Health Effects Associated with Exposures during the Gulf War (National Academy of Sciences, Washington,D.C.), on June 14, 1999. Information presented by the DU Team was included in the published book summarizing the Committee's findings: Gulf War and Health, Volume 1. Depleted Uranium, Pyridostigmine Bromide, Sarin, Vaccines, (Fulco, C.E., C.T. Liverman, H.C. Sox, eds.), National Academy Press, Washington, D.C., 2000.

***Other Representative Oral Presentations by AFRRI Scientists During 2004*:**

Biological Dosimetry Requirements: Postexposure Injury Assessment for Medical Management, 2nd Annual 20/20 Layered Membrane Symposium, 9700 Great Seneca Highway, Rockville, Maryland, November 3, 2004;

Current and Future Biological Dosimetry, 13th Annual Meeting of the CIRMS Biological Dosimetry Measurements and Standards, National Institute of Standards and Technology, Gaithersburg, Maryland, October 25-27, 2004;

Diagnostic Cytogenetic Biodosimetry: Automation and Validation, Council for Ionizing Radiation Measurements and Standards Symposium, October 25-27, 2004;

Ionizing Radiation Inactivation of Medically Relevant Viruses, Consensus on Ionizing Radiation Measures and Standards Meeting, National Institute of Standards and Technology, Gaithersburg, Maryland, October 25-27, 2004;

Inactivation of Simulant Biological Warfare Agents by Ionizing Radiation, Council on Ionizing Radiation Measurements and Standards, National Institute of Standards and Technology, Gaithersburg, Maryland, October 25, 2004;

Radiation Inactivation of Biological Threat Agents: Principles and Lessons Learned, American Type Culture Collection, October 18, 2004;

Biological Dosimetry Requirements: Postexposure Injury Assessment for Medical Management, Strategic Plan and Research Agenda for Medical Countermeasures Against Radiological and Nuclear Threats, National Institutes of Health (NIH), National Institute of Allergy and Infectious Diseases, Bethesda, Maryland, October 14, 2004;

Radiation Research Infrastructure, National Institutes of Health (NIH), National Institute of Allergy and Infectious Diseases Blue Ribbon Panel Meeting, October 14, 2004;

AFRRI's Support for the United States Postal Service: Environmental Testing at Brentwood and ECC Service, National Academies of Science, National Research Council Study, October 8, 2004;

Leukemic Transformation of Hemopoietic Cells in Mice Internally Exposed to Depleted Uranium, National Institute for Occupational Safety and Health Heavy Metals Meeting, Morgantown, West Virginia, September 12-15, 2004;

Postexposure Injury Protein Biomarker Assay for First Responders, 33rd Annual Meeting of the European Society of Radiation Biology, Budapest, Hungary, August 25-28, 2004;

Radioprotection by Natural and Synthetic Antioxidants, European Society for Radiation Biology, Annual Meeting, Budapest, Hungary, August 25-28, 2004;

Radioprotection by Soy Isoflavones, European Society for Radiation Biology, Annual Meeting, Budapest, Hungary, August 25-28, 2004;

5-Androstenediol: A Long-Acting Natural Systemic Radioprotectant with Low Toxicity, the European Society for Radiation Biology, Annual Meeting, Budapest, Hungary, August 27, 2004;

Radiation Protection by Alpha-Tocopherol Isomers and Esters, United States Army Center for Health Promotion and Preventive Medicine, Force Health Protection Meeting, Albuquerque, New Mexico, August 9-12, 2004;

Biodosimetry: Postexposure Radiation Injury Assessment Tools for First Responders: AFRRI's Contribution to Collaborative Efforts in Biodosimetry, Department of Homeland Security Workshop, Bethesda, Maryland, July 10, 2004;

5-Androstenediol: A Long-Acting Natural Systemic Radioprotectant with Low Toxicity, AFRRI Seminar, Bethesda, Maryland, July 9, 2004;

Effects of Radiation in Combination with Biological or Chemical Warfare Agents, Health Physics Society Summer School, July 6-9, 2004;

Infection Following Ionizing Radiation: Susceptibility and Therapy, National Institutes of Health (NIH), National Institute of Allergy and Infectious Diseases Meeting on Animal Models for Radiation Injury, Protection, and Therapy, Bethesda, Maryland, May 25-26, 2004;

5-Androstenediol: A Long-Acting Natural Systemic Radioprotectant with Low Toxicity, Animal Models for Radiation Injury, Protection, and Therapy Workshop sponsored by the National Institute of Allergy and Infectious Diseases, Bethesda, Maryland, May 25, 2004;

Biodosimetry Capabilities for Acute, Protracted, and Prior Radiation Exposure, National Institutes of Health (NIH), National Institute of Allergy and Infectious Diseases Workshop on Animal Models for Radiation Injury, Protection, and Therapy, May 20, 2004;

Radiation Inactivation of Biological Threat Agents: Principles and Lessons Learned, NWEUG, Basingstoke, United Kingdom, May 9-14, 2004;

5-Androstenediol: A Long-Acting Natural Systemic Radioprotectant with Low Toxicity, the Cleveland Clinic, Cleveland, Ohio, May 6, 2004;

Radiation Protection by Alpha-Tocopherol Succinate, Medical Research and Material Command, DAMD, April 26-28, 2004;

Development of a Quantitative RT-PCR Assay for Simultaneous Measurement of Four Amplicons with Applications for Biological Dosimetry, Radiation Research Society's 2004 Annual Meeting, Adams Mark Hotel, St. Louis, Missouri, April 24-27, 2004;

Diagnostic Biodosimetry Response for Radiation Disasters: Current Research and Service Activities at AFRRI, Human Factors and Medical Panel Symposium, NATO Medical Surveillance and Response, Budapest, Hungary, April 19-21, 2004;

Development of a Quantitative RT-PCR Assay for Simultaneous Measurement of Four Amplicons with Applications for Biological Dosimetry, Experimental Biology, Washington, D.C., April 18-20, 2004;

Current and Future Biological Dosimetry, National Council on Radiation Protection and Measurements (NCRP) Annual Scientific Meeting, Arlington, Virginia, April 14-15, 2004;

Combating Terrorism Directed through the United States Mail: Radiation Decimal Reduction Curve for Bacillus anthracis Ames, NATO Advanced Research Workshop, Budapest, Hungary, March 7-9, 2004;

Inactivation of Biological Warfare Agents by Ionizing Radiation, NATO Advanced Research Workshop, Radiation Inactivation of Bioterrorism Agents, Budapest, Hungary, March 7-9, 2004;

Health Effects of Depleted Uranium: Overview of AFRRI Research, Depleted Uranium, Technical Meeting, Defense R&D Canada, Ottawa, Canada, February 19-20, 2004;

DNA Identification by Short Tandem Repeat (STR) Analysis after 2 Decontamination of Human Autopsy Specimens by Ionizing Radiation, 56th Annual Meeting, American Academy of Forensic Sciences, Dallas, Texas, February 16-21, 2004;

Decontamination of Human Autopsy Specimens by Co Gamma-Photon Irradiation and Human DNA Identification by Short Tandem Repeat Analysis of Irradiated Tissues, American Academy of Forensic Sciences Annual Meeting, Dallas, Texas, February 16-17, 2004;

Inactivation of Bacillus *Spores with Ethylene Oxide*, Office of Science and Technology Policy, Executive Office of the President, and the Department of Homeland Security, Washington, D.C., January 23, 2004; and,

Biodosimetry Tools Supporting Medical Recording During Radiation Casualty Incidents, Health Physics Society Summer School Book, 2004.

***Representative Poster Presentations by AFRRI Scientists During 2004*:**

Clindamycin and Moxifloxacin Therapy for Bacillus anthracis *Infection in Co-Gamma-Irradiated Mice*, ICAAC, Washington, D.C., October 30 through November 2, 2004;

Preconceptional Paternal Exposure to Embedded Depleted Uranium Fragments, International Agency on Cancer Research: Short-Term Models of Carcinogenesis, October 19, 2004;

Mental Health Support in Radiation Incidents through Biodosimetry, 2004 Disaster Mental Health Institute Meeting, Rapid City, South Dakota, September 29 through October 3, 2004;

Cytogenetic Laboratory Automation and High-Throughput Analysis for Radiation Dose Assessment, European Society for Radiation Biology, Annual Meeting, Budapest, Hungary, August 25-29, 2004;

Protection Against Ionizing Radiation Injury by a Benzyl Sulfone Analog, Medical Research and Material Command, Principal Investigator's Meeting, Puerto Rico, April 26-28, 2004;

Susceptibility of Prostate Cancer Cells to Lipid Peroxidation, Radiation Research Society Annual Meeting, April 12, 2004;

Priority Research Areas for Radiological/Nuclear Threat Countermeasures, Radiation Research Society Meeting, April 6, 2004; and,

Radiation Dose Assessment by Fluorescent Microsphere-Based Immunoassays, The Society of Armed Forces Medical Laboratory Scientists Annual Meeting, Boston, Massachusetts, February 22-27, 2004.

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TECHNICAL QUALITY

The Transition of New and Improved Medical Technologies. AFRRI's Science and Technology Programs are soon expected to transition new and improved medical technologies into advanced development with Food and Drug Administration (FDA) approval and eventual fielding.

Six Defense Technology Objectives (DTOs) Guide the Thrust of AFRRI's Research. AFRRI's research programs present a strategic commitment that leans heavily toward moving products of basic and developmental research into definitive applied studies of safety and efficacy aimed at transitioning new and improved medical technologies into advanced development, with FDA approval, and eventual fielding.

Since 1998, AFRRI had been assigned four Defense Technology Objectives (DTOs); during 2003, two additional DTOs were assigned to AFRRI. A DTO is a specifically recognized high priority element of technology advancement, which will be developed or demonstrated and has an anticipated delivery date. The product of a DTO is expected not only to enhance military operational capability, but also to address other important issues such as affordability and dual-use application, both of which receive special emphasis in the Defense Science and Technology Strategy.

Each of the following six DTOs supports the Quadrennial Defense Review (QDR) transformation operational goal to Project and Sustain United States Forces:

- ***Pharmacologic Prevention of Ionizing Radiation Injury.*** This DTO will develop advanced medical strategies for the prevention of radiation injuries. Pharmacologic interventions based on 5-androstene steroids (5-androstenediol and analogs), a novel class of radioprotectants, will be designed and tested in preclinical model systems. Results will define the decision point for possible transition to clinical testing of preventive treatments designed to maximize protection of personnel against early arising radiation syndromes (i.e., performance decrement and lethality). Effective mitigation of health consequences and performance-degrading effects will: 1) reduce the casualty load at medical treatment facilities; 2) sustain a more effective operational force after a radiation exposure event; 3) allow commanders to conduct operations in radiation field environments with reduced risk of decremented performance due to acute tissue injury; and, 4) reduce the negative psychological impact on personnel tasked to operate in contaminated environments. Significant reductions in acute casualty rates are expected based on recent studies;

- ***Cytogenetic-Based Diagnostic Biodosimetry System.*** This DTO will develop a biodosimetry assay system, based on chromosomal aberrations, that permits a rapid, high-throughput capability to assess ionizing radiation exposure for large numbers of casualties. Symptomatology and physical dosimeters, even when available, do not provide adequate diagnostic information to treat life-threatening radiation injuries. The objective assay system will provide physicians with the ability to definitively triage radiation victims, make appropriate treatment decisions, reduce the uncertainties associated with the variability of individual responses to radiation exposure, and discriminate between cases of whole, versus partial, body exposures;

- ***Toxicity of Embedded Depleted Uranium.*** The objective of this DTO is to determine the long-term health effects from exposure to depleted uranium (DU) fragments by characterizing multiple biological indices indicative of carcinogenicity using experimental model systems. Friendly fire incidents during the Gulf War produced DU shrapnel injuries among United States soldiers. The success of this new class of munitions guarantees its large-scale deployment by future adversaries, greatly increasing the number of casualties with DU fragment injuries. Little is known of the health risks from chronic exposure to embedded DU fragments, due in part, to DU's unique combination of radiological and toxicological properties. Current treatment strategies are in the most basic stage of development, and conventional diagnostic capabilities do not differentiate DU from other shrapnel injuries. This technology effort will define the pathologic consequences of chronic exposure to tissue-embedded DU fragments using generally accepted *in vitro* and *in vivo* experimental systems, and develop rapid assessment tools to identify personnel wounded with DU. Data will provide risk analyzers and managers with the information needed to develop policies addressing the health hazards of DU, and to establish safe and effective treatment strategies to minimize the long-term health risks from DU shrapnel;

- ***Medical Countermeasures Against Bacterial Sepsis after Irradiation.*** This DTO compares the efficacy of selected antimicrobial therapeutic agents against lethal or incapacitating radiation-induced bacterial sepsis in an irradiated rodent model. The specific aims are to: 1) determine *in vitro* the susceptibilities of enteric microorganisms to fluoroquinolones and cephalosporins after oral therapy; 2) calculate pertinent pharmacokinetic/pharmacodynamic (PK/PD) parameters of the tested antimicrobial agents to provide necessary data for dose extrapolation for human use; and, 3) determine the most efficacious therapy against polymicrobial sepsis.

Polymicrobial sepsis, caused by both Gram-positive and Gram-negative bacteria, is the leading cause of death following acute whole-body irradiation. Ionizing radiation depresses immunity and damages intestinal epithelium, both of which promote microbial translocation from the intestines and sepsis. Effective medical countermeasures for battlefield-sustained radiation mass casualties will require a radically different approach than what is used to manage patients receiving chemotherapy or fractionated radiation therapy under highly controlled conditions. Appropriate antimicrobial therapy is critical because bacteria develop resistance; use of an inappropriate antimicrobial therapy exacerbates the injury. Therapy must target only the endogenous and exogenous bacteria, both Gram-positive and Gram-negative, that cause sepsis and not the beneficial gut microflora, including anaerobic bacteria. Use of antimicrobial agents alone does not assure recovery from sepsis in an irradiated neutropenic animal. This effort will examine antimicrobial agents in a rodent model to enhance treatment strategies for radiation-induced infections. The long-term goal of this study is to develop an improved therapy against lethal or incapacitating ionizing radiation-induced bacterial sepsis in potentially large numbers of human casualties. Findings can be transitioned to preclinical studies to secure an FDA indication for antimicrobial therapy for managing bacterial infections in irradiated personnel. Results will allow recommendations for optimal choices for treatment that will enhance survival in military operational environments;

- ***Molecular Biomarkers-Based Diagnostic Biodosimetry System.*** This DTO will develop a biodosimetry assay system based on radiation dose-dependent alterations in gene expression and their encoded proteins. The system will measure changes in the relative concentrations of cellular messenger RNA and blood proteins (molecular biomarkers) and will provide for early, forward field-based radiation exposure assessment. Successful efforts will produce the following results: 1) molecular biomarkers can be measured rapidly (within hours) with the same hand-held and field-laboratory analytic systems used to identify biological weapons agents; 2) the assay system will provide the ability to distinguish individuals

not exposed, including the worried well, from exposed individuals (>10 cGy) and to determine individual exposure doses before the onset of symptoms to aid decision-making for medical triage; and, 3) assessment of a radiation dose early after exposure enhances the operational commander's situational awareness of the radiation exposure status of deployed forces and increases the prospect of reduced morbidity and mortality through early medical intervention; and,

- ***Prevention of Ionizing Radiation Injury by Isoflavones.*** This DTO will develop advanced medical strategies for the prevention of radiation injuries. Preliminary findings on the isoflavones, genistein and daidzein, demonstrate promising radioprotective efficacy with a single subcutaneous injection or multiple oral doses in a rodent model. The soybean and clover isoflavones, genistein and daidzein, will be evaluated in a preclinical animal model for radiation protection. Results will define the decision point for possible transition to clinical testing of preventive treatments designed to maximize protection of personnel against early arising radiation syndromes that result in mortality. Products of this effort will give the warfighter a level of protection against radiation-induced injury. Desirable characteristics of the products will include: 1) the provision of additional options for radioprotective therapies that can be used alone or in combination with other agents (i.e., 5-AED). Additive or even synergistic effects may be realized with combinations of drugs; 2) increased survivability and decreased morbidity; 3) reduced casualty loads at medical treatment facilities; 4) ability of commanders to conduct operations in radiation field environments with reduced risk; and, 5) reduced psychological impact on personnel tasked to operate in radiation environments.

Four Research Thrusts. There are four major AFRRI research thrusts, each carried out by a team of AFRRI investigators:

The Radiation Casualty Management Team. The Radiation Casualty Management Team investigates the full spectrum of medical countermeasures for an external exposure to ionizing radiation. Drug compounds are under development that can potentially elevate tolerable thresholds of ionizing radiation, leading to injury reduction and saved lives. The team investigates compounds that carry anti-oxidant or DNA damage surveillance and repair stimulating properties, or compounds that impart cell-cycle regulatory activities or immune system-enhancing characteristics that, when combined, provide important radioprotective qualities. The team also develops treatments for life-threatening injuries to the blood forming and gastrointestinal systems and the lungs. ***AFRRI investigators have demonstrated the significant radioprotective qualities of a non-androgenic steroid, 5-androstenedial (5-AED). The drug has no measurable toxicity at the doses being used to achieve protection.*** On-going research includes attempts to deliver similar protective efficacy by the oral route of administration and should lead to a product that can be more easily managed logistically and used by deployed military troops. In October of 2001, AFRRI investigators and representatives from its corporate partner presented preliminary data and a research plan for clinical trials of 5-AED at a pre-investigational new drug meeting before the United States Food and Drug Administration (FDA). The plan was favorably received; and, the FDA provided valuable guidance on how to proceed with pre-clinical trials toward an Investigational New Drug (IND) application.

Since that time, the corporate partner of AFRRI completed two pilot studies in nonhuman primates, during 2003, demonstrating efficacy when 5-AED is administered both pre- and immediately post-exposure to gamma photons. AFRRI also established a contract to carry out the pre-clinical safety and toxicity

studies under current good laboratory practices (cGLP) conditions that are required prior to an IND application. On April 1, 2005, the corporate partner, Hollis-Eden Pharmaceuticals, Inc., announced that it has initiated the first in a series of Phase I safety and pharmacokinetic clinical trials with NEUMUNE(TM) (HE2100) - *<Note: NEUMUNE(TM) = HE2100 = 5-Androstenediol-5-AED>*, its investigational immune regulating hormone for the treatment of Acute Radiation Syndrome. This first study is being conducted in the Netherlands. ***The corporate partner also stated that it continues to expect to file an IND application with the FDA in the first half of Calendar Year 2005 to initiate clinical studies in the United States. Safety and pharmacokinetic study results are expected to be available in a timeframe that enables the corporate partner to initiate a pivotal efficacy study in non-human primates in the second half of 2005***;

The Biological Dosimetry Team. The Biological Dosimetry Team has significantly advanced the science of radiation dose assessment and the application of biological methods for measuring exposure. The purpose of this research is to develop rapid assays to measure radiation exposure, which will enhance casualty management and treatment and will distinguish the *concerned public* from those with radiation injuries. Recent advancements include the demonstration of *proof-of-concept* that early measurements of molecular biomarkers can identify individuals exposed to radiation. Advancements also include the use of automation to enhance the throughput of the reach-back cytogenetic bioassay for triage and definitive dose assessment, using the *gold standard* cytogenetic bioassay, the lymphocyte metaphase spread dicentric bioassay. AFRRI scientists were key participants in the Department of Homeland Security (DHS) sponsored workshop, *Biodosimetry - Post-Exposure Radiation Injury Assessment Tools and Methods for Health Care Workers and First Responders*, conducted at USU on July 9-10, 2004. DHS has established a joint interagency working group (JIWG) to facilitate the development of a research roadmap for this purpose; and, an AFRRI scientist was appointed as a member to the JIWG. Several AFRRI scientists were also invited participants at the October 2004 annual meeting of the Council on Ionizing Radiation Measurements and Standards, which was held in Gaithersburg, Maryland. The meeting focused on biological dosimetry measurements and standards. In addition, AFRRI's biodosimetry research accomplishments were presented at the *October 2004 Blue Ribbon Panel Meeting, NIH Strategic Plan and Research Agenda for Medical Countermeasures Against Radiological and Nuclear Threats*, held in Bethesda, Maryland. In these and other national and international meetings (i.e., the *2004 Annual Meeting of the European Society of Radiation Research* held in Budapest, Hungary; and, the *International Conference on the Study of Ionizing Radiation Dosimetry, Thematic Network* held in Barcelona, Spain), AFRRI shared its findings with the research community interested in enhancing the national capability to respond to medical radiological emergencies.

AFRRI's Biodosimetry Assessment Tool (BAT) software program was developed to promote the rapid collection of data for early use after a radiation exposure incident; to provide diagnostic and therapeutic information needed to manage radiation casualties; and, to record related clinical information (i.e., extent of contamination, wounds, infection) necessary for the proper medical care of radiation casualties. ***In 2004, AFRRI launched the Radiation Biological Dosimetry Tools for Emergency Responders web page*** at <*www.afrri.usuhs.mil/www/outreach/biodostools.htm*>. Visitors can access tools that include BAT; the AFRRI Adult/Pediatric Field Medical Record, a convenient one-page form for gathering emergency medical information in the field; and, the AFRRI Biodosimetry Worksheet, a four-page data entry worksheet that provides a place for recording facts about a radiation exposure case, including the source and type of radiation, the extent of exposure, and the nature of the resulting injuries. These documents are applicable to both adult and pediatric cases. Another program currently being developed at AFRRI is the ***First-Responder Radiological Assessment Triage (FRAT)*** software program, a complementary product to BAT and intended for use on hand-held personal digital assistant devices. FRAT will provide data

collection templates for analyzing clinical signs and symptoms, lymphocyte counts, physical dosimetry, radioactivity, and location-relevant dose estimates. Like the BAT, FRAT provides a triage dose assessment by comparing data collected in templates with radiation dose responses obtained from the literature. The use of this application to monitor an individual's diagnostic information could minimize psychological injury by correcting the way radiation casualties and the concerned public view exposure, dose, and risk of future disease;

The Heavy Metals Research Team. In partial response to concerns over Gulf War Illness, the Heavy Metals Research Team (originally, the Depleted Uranium Team) was established to study the biological consequences and potential health risks from chronic exposure to tissue-embedded depleted uranium (DU). The team's research findings have resulted in a change to medical doctrine, which calls for a more aggressive removal of DU shrapnel fragments. The AFRRI team members work closely with the DoD Department of Deployment Health Support as subject matter experts and consultants on DU and other heavy metals issues and collaborate with the Department of Veterans Affairs in its program to medically follow Gulf War veterans wounded by DU shrapnel. Team members have been called upon on several occasions to give testimony before Congress in this regard. The development and refinement of an inductively coupled mass spectrometry procedure, which can differentiate DU from natural uranium in biological samples, has become an integral part of this collaborative study and has contributed to AFRRI's being recognized as a center of excellence in DU studies. AFRRI's consultation and expertise greatly helped to defuse the 2001 crisis within the NATO alliance, stemming from claims by some allied forces that DU exposures during operations in the Balkans were the cause of serious personal illness. The development of a simple chemical assay for DU, which can be configured into a compact, rapid field test to aid triage and medical management decisions, is another achievement of the Heavy Metals Research Team. ***The Rapid Field-Based DU Detection Assay has been patented and is expected to transition within the next two to three years.*** The AFRRI team is also investigating the health effects of exposure to metal alloys proposed as surrogates for DU in armor-penetrating munitions. The surprising toxicity exhibited by one of the leading candidate alloys, a metal also used in the arsenals of certain nations, resulted in an advisory to United States military surgeons, before Operation Iraqi Freedom, to monitor for wounds resulting from shrapnel of that class of alloys. The AFRRI team has served as an advisor to the DoD Office of Health Affairs and the United States Army Medical Research and Materiel Command (USAMRMC) in these areas and is continuing its research in the areas of DU and DU-replacement alloys, supported by several USAMRMC grants. Since 1998, the team has published 31 articles in peer-reviewed journals, including seven during the period from 2003 to the present. These efforts and their validation in peer-reviewed publications have made the AFRRI Heavy Metals Research Team a focal point of recognized expertise frequently consulted by DoD and other United States and NATO government policy makers; and,

The Radiation Infection Treatment Team. Following the direction of the Director, BioSystems, Office of the Director, Defense Research and Engineering, AFRRI's Nuclear, Biological and Chemical Interactions and Countermeasures Team's scope of effort was considerably narrowed and shifted to a new area of concentration. The newly named Radiation Infection Treatment Team now focuses on the problem of understanding and developing medical countermeasures against the radiation-induced translocation of intestinal bacteria into the bloodstream, and other naturally occurring infectious sequelae that accompany higher doses of ionizing radiation. Its staff of highly trained and experienced microbiologists extends the work of the Radiation Casualty Management Team by concentrating on studies to develop preventive and treatment measures for polymicrobial sepsis. Ionizing radiation damages the cellular components of the immune system and the epithelial linings of the intestinal track and respiratory system. The damage to epithelial tissues creates portals of entry into the circulatory system for microbial agents. This, combined

with an impaired immune system leads to polymicrobial sepsis, which is the leading cause of death due to radiation injury. The team's initial objectives are to establish animal models that appropriately represent radiation-induced microbial sepsis and then to begin examining several proposed prophylactic and treatment measures that include the use of new-generation antimicrobial agents, biological response modifiers and probiotic agents.

During 2003, initial studies were completed in a small animal model demonstrating the efficacy of new-generation antibiotics for treating opportunistic infections following sublethal irradiation. The team initiated preparations for more definitive studies in a large animal model, with a long-term goal of obtaining FDA approval for re-labeling currently licensed antibiotics for use in treating radiation-induced sepsis. During 2004 and 2005, to the time of this writing, the Radiation Infection Treatment Team provided six publications for DoD and NATO, two abstracts for national and international colleagues, three nationally attended presentations, one training session for the American Society for Microbiology, and support to two extramural collaborative efforts (further detail is provided at the AFRRI section of Appendix C).

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RESPONSE TO THE SPECIAL REQUIREMENTS OF MEDICAL READINESS

AFRRI Projects Address Requirements of Military Operations and Homeland Security. AFRRI's portfolio of current and planned projects adequately addresses needs related to military operations and homeland security through an on-going review process by four entities.

> **...At the same time, the Institute** (AFRRI) **supported national antiterrorism programs and military exercises and operations. For Operation ENDURING FREEDOM in Kuwait, the Institute developed emergency response plans; and for Operation IRAQI FREEDOM, it provided guidance on treatment of personnel with embedded depleted uranium or tungsten alloy fragments and conducted studies on the use of ionizing radiation to decontaminate human remains. By their exemplary performance of duty, the members of the Armed Forces Radiobiology Research Institute have brought great credit upon themselves and to the Department of Defense.**
>
> - **Donald Rumsfeld, Secretary of Defense,** taken from the Citation to Accompany the Joint Meritorious Unit Award, signed on February 17, 2004.

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Four Entities Guide Research Thrusts or Provide Oversight and Review. Four entities provide guidance on program objectives and product development based on specific military requirements and oversight and review of the AFRRI research programs.

The AFRRI Board of Governors. At least once each year, the AFRRI Board of Governors meets to assist in the oversight of AFRRI's radiobiology research, to advise and review program plans and accomplishments, and to ensure compliance with Service Requirements. The AFRRI Board of Governors consists of the Assistant Secretary of Defense for Health Affairs; the Surgeons General of the Army, Navy, and Air Force; the Deputy Chiefs of Staff for Operations of the Army, Navy, and Air Force, or their designated representatives; and, the President of USU.

In July of 2004, the AFRRI program was peer reviewed at the Board of Governors Meeting. The two scientific reviewers stated: **The overall program is well-rounded and responsive to the AFRRI mission of assessment, protection, and treatment of radiation injury. Indeed, we acknowledge that AFRRI is a unique resource with a clearly-stated mission not being addressed elsewhere in the country. This mission is tightly linked with U.S. scientific policy decisions, primarily in the area of potential radiological terrorist attacks. The AFRRI Director and Scientific Director are doing a first-class job in keeping the scientific mission focused within the constraints of limited resources and professional staff. They are also to be commended for their many external activities related to federal guidance on the implementation of scientific resources and improvement in the scientific knowledge base in the radiation sciences.**

During an earlier meeting held on April 24, 2003, the AFRRI Board of Governors addressed that the core funding of AFRRI is inadequate for research and facility maintenance and adversely impacts on product transition. The Board indicated that beginning in Fiscal Year 2006, it expected that AFRRI would have an opportunity to participate in the DoD budgeting process through an appropriate acquisition authority. A Senior Review Group, as designated by the Office of the Secretary of Defense, will be examining the necessary process. Other issues referenced the absence of formalized funding for the Medical Effects of Ionizing Radiation (MEIR) Course and the lack of identification of the training requirements from the Services. The Board recommended that Health Affairs coordinate a meeting with the Defense Medical Readiness Training Institute (DMRTI) and AFRRI/USU to address the fielding of medical nuclear/radiological distance learning. The Army, Navy and Air Force would also need to establish policy on medical nuclear/radiological training requirements. In addition, the Board noted that Operational Requirement Documents for medical nuclear/radiological defense materiel do not exist to support the needs of the Services. It was decided to identify Army, Navy, and Marine CBT Development Activity and Joint Requirements Office POCs to develop a Mission Needs Statement and Joint Service Operational Requirement Documents for medical nuclear/radiological products. As of April 2005, the recommended meeting with Health Affairs, DMRTI, and USU/AFRRI has not as yet taken place; the Director of AFRRI will address the above described required actions at the next meeting of the AFRRI Board of Governors.

The United States Army Nuclear Chemical Agency. Every two years, the United States Army Nuclear Chemical Agency (USANCA), with the assistance of AFRRI subject matter experts, publishes its Specific Military Requirements (SMRs) for Nuclear and Chemical Defense. Three of USANCA's top 20 requirements fall within the mandates of AFRRI's Medical Radiological Defense Research Program and were influential in the establishment of AFRRI's current Defense Technology Objectives.

The last SMRs workshop was held in April of 2003, to prepare for the Fiscal Year 2005/2006 Specific Military Requirements. Six medical radiological defense items were ranked in the top 20 SMRs, one of which was number four (on radioprotectants). The SMR workshops are generally scheduled in mid-April; the call for the Fiscal Year 2005 workshop has not as yet been issued.

The Medical Force Protection Integrated Concept Team. AFRRI is a member of the Medical Force Protection (MFP) Integrated Concept Team (ICT). This team has the responsibility to identify futuristic medical requirements for addressing MFP for the total force under all combat and non-combat conditions; this includes protection of the service member on the battlefield, at the site of injury, through his/her time spent on active duty, and following the service member's departure into civilian life and retirement. It is well within the scope of the MFP/ICT to recommend that joint requirement documents be established for medical radiological defense products such as pretreatment and treatment pharmaceuticals and fieldable and rapid assessment biodosimetry techniques.

The Office of the Director, Defense Research and Engineering. The Office of the Director, Defense Research and Engineering (DDR&E) conducts a technology area review and assessment (TARA) every two years. The TARA process includes, but is not limited to, a comprehensive review of AFRRI's DTO's (Defense Technology Objectives) relative to each DTO's stated milestones and metrics and whether the DTO objectives adequately focus on requirements. A program overview sponsored by DDR&E was held on June 25-27, 2001. AFRRI presented each protocol related to four main program areas: Biological Dosimetry;

Depleted Uranium; Radiation Casualty Management; and, NBC Combined Effects and Countermeasures. The main finding was the requirement to define a process for transitioning products from the Science and Technology P6.3 Program to the Advanced Development Programs, P6.4 and P6.5.

The last TARA was held in March of 2003. To date, there is nothing definitive for AFRRI on P6.4/P6.5 funding for advanced development (acquisition) of medical radiological defense products; such funding is tied to the requirements process. Without a military requirement *(the United States Army Nuclear Chemical Agency (USANCA) Specific Military Requirements (SMRs) for Nuclear and Chemical Defense are not included as military requirements)*, a formal acquisition program funded with P6.4/P6.5 appropriations cannot be initiated. The Fiscal Year 2005 TARAs were not held; indications reflect that DDR&E intends to reevaluate and possibly restructure the TARA process. The next TARA has not as yet been scheduled (TARAs are generally held in March and are scheduled in the Fall of the proceeding year). The newly established Joint Program Executive Office (JPEO), tasked to control the funding of acquisition programs, has indicated interest in several AFRRI products; one meeting between AFRRI and JPEO took place in the Fall of 2003, to review an initial draft of a Capability Development Document. Subsequently, the Joint Requirements Office (JRO) has ceased activity on the Capability Development Document (CDD) for radioprotectants because it was determined that, under the new requirements system, an Initial Capability Document (ICD) must first be developed. The JRO has also decided to combine all CBRN requirements included at the ICD stage into two separate areas: therapeutics and prophylactics. A therapeutic ICD for medical CBRN was developed early in 2004 and is currently in coordination for concurrence across the Service elements, the Joint Staff, and the Office of the Secretary of Defense. A prophylactic ICD was drafted early in 2005 and is under review prior to coordination. Medical radiological defense issues are covered in both of these ICDs.

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OPTIMIZATION OF FUTURE OPERATIONS

Facility Improvements.

Cobalt Refueling. The *June 2004 Refueling Operation* increased the Cobalt Irradiation Facility's amount of cobalt-60 from 100,000 curies to about 450,000. The new cobalt rods ensure that AFRRI can continue to perform a wide array of experiments safely and efficaciously for at least 10 years before the next refueling.

Animal Facility Accreditation. The Association for the Assessment and Accreditation of Animal Care (AAALAC) International conducted a comprehensive review of the AFRRI Animal Care and Use Program, to include policies, procedures, records, and facilities and granted restoration of full accreditation.

Animal Care Facility Improvements. A new state-of-the-art cage wash system was installed and the steam station was also upgraded to meet system requirements and to accommodate the future expansion of services by the Veterinary Sciences Department. Other improvements to the facility, which currently houses 6,000 animals, included a new non-potable hot water supply system that quadruples the original capacity, virtual air volume devices for climate control and remote monitoring, and variable frequency drives that improve the effectiveness and efficiency of the air handlers.

HVAC and Security Systems. Projects are currently underway to repair the heating, ventilation, and air conditioning (HVAC) systems throughout AFRRI. The first phase is to upgrade the controls that alert the technicians to HVAC problems and assist with their resolution. In addition, a contract has been set in place to replace the physical security system, during 2005.

NRC License. The Nuclear Regulatory Commission (NRC) has renewed AFRRI's radiation license of broad scope, which allows the use of byproduct material for the next 10 years.

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Resource Sharing Continues Between USU and AFRRI.

Continuation and Expansion of On-Going Cost-Avoidance Measures by USU and AFRRI. Both USU and AFRRI agree that on-going, cost-effective measures, initiated during 1992, will continue and be expanded, as appropriate. Some examples follow: 1) all contracts and maintenance agreements will be frequently reviewed for cost avoidance and savings; 2) the USU Security Division will continue to process security background investigations for the contracted employees assigned at AFRRI; 3) the USU Civilian Human Resources Directorate will continue to provide all personnel requirements for AFRRI in accordance with current agreements; 4) the USU Administrative Support Division will continue to provide support for AFRRI's visa/passport requirements; 5) the USU Contracting Directorate will continue to provide guidance and back-up support for the employee assigned with the AFRRI contracting/support requirements; 6) the

AFRRI and USU Directors of Laboratory Animal Medicine will continue to share equipment and use joint purchases for supplies; 7) the USU Learning Resources Center (Library) will continue to provide all related services for AFRRI in accordance with current agreements; 8) collaboration on occupational medicine training requirements will continue; 9) the USU Veterinary Pathology Division will continue its support for AFRRI's microbiology and electron microscopy requirements; the AFRRI Veterinarian Pathologist will continue to assist USU as required; 10) USU will continue to serve as the Internet Service Provider for AFRRI; the on-going sharing of Self-Help videos and distance learning expertise will continue; and, 11) the USU Military Personnel Office will continue to share its Equal Opportunity and mandatory training classes with the AFRRI military personnel.

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Necessary Steps Are Identified to Remedy Deficiencies in Resourcing.

Determination of Staffing/Funding Requirements. Generally, when an organization is integrated within another, there are anticipated savings in manpower and operating costs throughout the administrative and support areas. However, due to continuous and significant reductions in the AFRRI budget over the past years (beginning in 1992/3 when AFRRI's funding was reduced by over 40 percent), the manpower levels in the AFRRI administrative/support areas have been consistently reduced, at times below recommended manpower levels. At the same time, the USU administrative support staff has been maintained at the minimum level required to support the University's mission and to assure compliance with its controlling regulations. A joint recommendation by both USU and AFRRI has been documented in the Administration Plan of October 2000 for five additional administrative hires by AFRRI in the areas of Security, Facilities, and Research Administration. The inclusion of the funding for these additional five hires ($262,000) was included in the estimated cost of staffing AFRRI during FY2002 and beyond. During March of 2005, approval was received and the hiring of an electrician was completed by the AFFRI Facilities Division.

One-Time Property Renovation Costs. AFRRI's urgent requirements for real property maintenance and repair and/or renovation projects were not addressed until late in 2003 due to AFRRI's consistent budget reductions, which began in 1993. The Facilities Divisions of USU and AFRRI coordinated to provide an estimated total cost for addressing these concerns. The estimated one-time cost for renovations and/or repairs totaled four million dollars. These real property maintenance and renovation projects were urgently required for the continued use of AFRRI's 173,000 square foot complex; the costs were discussed with the Office of the Director of Defense Research and Engineering. The projects included: the building of firewalls; the renovation of the heating, ventilation, and air conditioning (HVAC) systems; major laboratory upgrades; and, the renovation of elevators. All of the projects were five to ten years beyond the recommended timeframes for implementation.

Funding for the above mentioned renovation projects was scheduled for receipt by AFRRI over two years, during Fiscal Years 2003 and 2004. The Fiscal Year 2003 installment of two million dollars was not received until late 2003 because of reprogramming delays for funding AFRRI's entire program, as discussed earlier in the *Governance* section at the beginning of the AFRRI portion of the USU Journal. Initial funding allotments have been concentrated on major upgrades to the Veterinary Facility cage wash system and initial repairs to the HVAC and security systems. Plans are being finalized for the complete renovation of the electrical, heating, ventilation, air conditioning, and steam supply systems. The allocation/obligation

of the remainder of the funding received during 2003 and 2004 is scheduled for completion during June of 2005.

Recently Completed Projects.

Upon receipt of funding from DDR&E, the AFRRI Facilities Division replaced the aging cage wash system in the Veterinary Science Department (VSD) with a state-of-the-art system manufactured by Lynx Products Group; the system is specifically designed for AFRRI's unique cage sizes and equipment. The system can be remotely monitored and changes in protocols can be made in minutes to facilitate a particular piece of equipment. In addition, the manufacturer is linked to the system via a dedicated telephone line to a computer in the animal husbandry office, which provides immediate communication with various components of the system and permits immediate troubleshooting and assistance.

Associated with the installation of the new cage wash system, the steam station has been provided with all new valves, controls, monitoring devices, and an increase in the piping size from two inches to either three or four inches, depending upon the device. This increased capacity meets the requirements of the new cage wash system and provides flexibility for projected increases by VSD. In addition, the non-potable hot water supply system has been upgraded with an increase in capacity four times that of the old system; this upgrade meets the requirements of the new cage wash system and also provides flexibility for increased capacity.

On the first and third floors of all VSD animal rooms, the AFRRI Facilities Division has installed new virtual air volume (VAV) devices to properly control air temperature, humidity and negative pressure, which meet both DoD and AAALAC requirements. The VAV devices, located on the wall outside of each animal room, efficiently provide the caretaker with vital LCD digital information. The system also provides remote computer access for the Facility Manager and the HVAC Technician, which allows monitoring of the entire system and permits remote adjustment, when required. Adjustments to the system can also be made, by room, via a compatible laptop computer. Future plans include that the on-call VSD animal caretaker will be provided with a warning device for identifying system malfunctions throughout the animal rooms. The second floor of the VSD is scheduled to be retrofitted during 2005.

The Facilities Division has also installed variable frequency drives (VFDs) to the air handlers in Penthouse 47 of the VSD. These air handlers supply and exhaust air for the animal colony. They work in conjunction with the VAV devices as vital components for maintaining temperature, humidity and air volume throughout the VSD; in addition, the VFDs provide substantial energy efficiency and substantially reduce electrical costs. Prior to the installation of the VFDs, the air handler constantly ran at top speed, which caused significant wear on the equipment and components and required maximum utilization of electricity. The VFDs now allow the system to cost-effectively run on a demand basis.

The replacement of the HVAC controls in Penthouse A is currently underway. The new system will provide remote computer control for the Facilities Manager and the HVAC Technician; following an alert, it will identify the cause and location of a problem. In some cases, adjustments or corrections will be remotely made. This represents the first phase of the renovation of the entire HVAC system throughout the AFRRI complex.

A contract to replace the existing security system has been completed for $460,000. Installation was initiated in March of 2005 and should be completed by September 30, 2005. While AFRRI has

completed and scheduled many other projects, the above-described accomplishments have taken place over the past 18 months. AFRRI will continue the renovation of its infrastructure as funding permits.

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AFRRI's Internal Response to Budget Deficiencies.

AFRRI's Internal Program Management. Due to consistent budgetary reductions, in order to maintain a vibrant and productive program, AFRRI has re-engineered its strategic approach to program management and resource allocation. A system of planning, programming, budgeting, review and analysis rounds out a streamlined process that focuses on programmatic relevance, scientific merit, and monitored productivity. This system is structured so that professional and technical staff at all levels within the Institute become stakeholders in the program and are more fully committed to meeting the Institute's goals and objectives. The implementation of this comprehensive, constantly evolving management strategy has had a profound impact on productivity and the quality enhancement of program output.

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Product Transition.

Products Identified for Transition. AFRRI has identified numerous candidate products for transition within the next ten years. With funding projections in hand, AFRRI has identified the unfunded requirements. Products identified for transition include: 1) true radiation radioprotectant drugs to help prevent radiation injuries in service members and emergency response personnel who may be called upon to operate in nuclear or radiological environments; 2) treatment drugs for radiation injuries that enhance immune system function and accelerate recovery of the blood-forming system and drugs for treating radiation-induced infections; 3) treatment strategies to replace the trauma of bone marrow transplants and the complications of transplant rejection; and, 4) procedures for rapid biological assessment of radiation dose are being developed, which will contribute to the delivery of more timely and effective triage and the medical management of the radiation-injured; this will help to distinguish between the truly physically injured and the *worried well*. In the event of a serious incident, radiophobia and psychologically stressed populations would be significant and must be quickly dealt with in order to reassure the general public and to effectively manage the response. And, as discussed earlier, AFRRI will continue to coordinate with the Joint Program Executive Office (JPEO) to establish joint military requirements against which P6.4/P6.5 funding for advanced development can be justified.

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